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OF THE

UNIVERSAL MEDICAL SCIENCES

A YEARLY REPORT OF THE PROGRESS OF THE GENERAL
SANITARY SCIENCES THROUGHOUT THE WORLD.

EDITED BY

CHARLES E. SAJOUS, M.D.,

AND

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ASSISTED BY

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GENERAL THERAPEUTICS.

BY J. P. CROZER GRIFFITH, M.D.;
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Absinthine.—Terray[164, May 28; 151, July] asserts that absinthine, unlike other bitters, as gentian, for instance, diminishes the movements of the stomach.

Acetanilid, Antifebrin.—Rose[2, Feb. 7] has obtained the best results with antifebrin by giving 5-grain (0.32 gramme) doses in 2 or 5 drachms (7½ or 15 cubic centimetres) of brandy. More than four 5-grain doses in the twenty-four hours are never given. The depressing action of antifebrin on the heart was considered to be reduced to a minimum by its administration with the brandy. The writer has had neither cyanosis nor collapse occur in any of his cases. Demme[650, Jan. 1; 161, Mar.] has observed that this drug, carefully used, produces excellent results in the treatment of the febrile diseases of children. If it does not modify the morbid processes of acute rheumatic polyarthritis, it certainly and most promptly reduces the high temperature. Its antipyretic action is pure and simple, and less prone than other similar drugs to produce skin eruptions. The author thinks that the action of acetanilid upon the hectic fever of tubercular phthisis is almost a specific. It may be given once, twice, or thrice daily, as follows: For children 2 to 4 years old, ½ to ¾ grain (0.032 to 0.049 gramme); 5 to 10 years, 1 to 2 grains (0.065 to 0.13 gramme); and 11 to 15 years, 2 to 3 grains (0.13 to 0.19 gramme).

H. B. Ely[186, Jan.] considers acetanilid one of the greatest discoveries of modern medicine. He not only uses it in *la grippe*, pneumonia, and typhoid fever, but finds great advantage in 5-grain (0.32 gramme) doses, repeated every two hours, in painful menstruation, especially of young girls. J. W. Frankhauser[760, Apr. 4] reports a case of poisoning, in a woman aged 37 years, by the use of three 5-grain (0.32 gramme) doses of acetanilid. The medicine was used to allay an attack of neuralgia, and was given every hour. The skin became cold and blue, this effect being especially noticeable on parts exposed to the air. The arms, which were covered with clothing, were not so well marked in this respect. The mucous membranes throughout the body were of a dark, cyanotic color; the heart's action feeble; expiration prolonged, with a constant desire to keep the extremities in motion. Temperature, 99° F. (37.2° C.). These symptoms continued for six hours, when there was an amelioration, the patient, however, remaining weak for several days. Spencer[39 Apr.] relates the case of a child, 5 years old, who was suffering from pertussis and who took by mistake 1 drachm (3.89 grammes) of antifebrin. He became very blue, and the respirations were slowed. The restorative treatment consisted in stimulation and hot baths. The large dose had an excellent effect on the whooping-cough. T. M. Dunagan[74 Mar.] reports a case of subnormal temperature, in a man aged 40 years, produced by a second dose of 7 grains (0.45 gramme) of antifebrin administered two hours after the first. The temperature, which had been taken and noted to be normal before the administration of the drug, was 97½° F. (36.4° C.). A. C. Davidson[271 Apr.] reports toxic symptoms following a single dose of 8 grains (0.52 gramme) of antifebrin. The patient presented all the more characteristic signs of a person suffering from an insufficiency of oxygen. It was also noted that the eyes were tightly closed during the whole time in which the more prominent toxic symptoms prevailed.

Acids.—An excellent contribution to the study of the digestive value of the different acids has been published by M. J. Thoyer,[220 Apr.3] who draws the following interesting conclusions: 1. Hydrochloric acid, in combination with pepsin, is the most active in the transformation of albuminoid substances into peptones. 2. It is not, however, the only agent possessing this peptonizing property. Other acids, as sulphuric, acetic, oxalic, tartaric, citric, lactic, and hydrofluoric, when combined with pepsin, possess this property in various, though lesser, degrees.

Acidum Asepticum.—Acidum asepticum (borcresolhydrogenperoxyd) was discovered in 1885 by Busse. It is miscible in any proportion with water, giving to it a light-yellow color, with a slight odor and a taste suggesting that of a caustic. Max Linde[69 Feb.6] states that if acidum asepticum be brought in contact with blood or pus, oxygen is immediately liberated, with the destruction of the blood or pus. This change does not take place when the acid is mixed with other albuminous liquids, such as milk or urine containing albumen. Linde has made a trial of this new substance in diphtheria, tuberculous abscess, and in badly-smelling, phlegmonous wounds, in all of which cases granulations quickly formed after applications of a strength of 50 and 100 per cent. The best results were obtained in the severe cases of diphtheria, where the galvano-caustic method of Hagedorn and himself could not be employed. A 10-per-cent. solution was also used in washing out the nasal cavities. This substance has been employed for several years past in dentistry. Linde recommends it as a valuable antiseptic, possessing non-poisonous properties.

Aconite.—Jonathan Hutchinson[806, Jan.] uses aconite in very large doses, his favorite preparation being the tincture (not Fleming's), and the dose being often as large as 10 minims (0.60 cubic centimetre), three times a day. This amount is always used in rheumatic iritis, in combination with the iodide of potassium and alkalies. He also considers it useful in relieving the pain of cancer. From a study of the action of aconite, W. C. Caldwell[779, May] holds that the drug can be used with advantage at the onset of sthenic fevers, because it lowers the high arterial tension, causes free diaphoresis and diuresis, reduces temperature, and diminishes peripheral irritability. In cases of exhaustion, when the pulse becomes soft and weak, aconite should be withheld. It is also contra-indicated in typhoid and other asthenic fevers. From its local action on the sensory nerves, aconite is of service in those acute affections where painful irritation is a local manifestation. John Aulde[1, Jan. 10] recapitulates the uses of this drug as laid down in recent works on therapeutics. Tison and Bourbon[35, Dec. 17, '90; 25, Jan.] have found the treatment of erysipelas of the face by the use of nitrate of aconitine eminently successful. The aconitine was given in doses of $\frac{1}{10}$ milligramme ($\frac{1}{640}$ grain) every two hours, taking care not to exceed a daily dose of 1 milligramme ($\frac{1}{64}$ grain). The course of idiopathic facial erysipelas was greatly lessened, and there was also great relief from pain. A case of fatal poisoning by a single unknown dose of aconitine is recorded in France.[100, Sept. 8] The physician who administered the aconitine was fined $20 (100 francs).

Aconitine.—See Aconite.

Actina.—The patent medicine recently placed upon the market under the name of actina is nothing, according to Flavel B. Tiffany,[102 Apr.] but a mixture of oil of mustard and menthol crystals. The same author has used these drugs, as inhalations or in the form of vapor, with asserted beneficial results in migraine, ciliary neuralgia, and otitis media. He employs the following prescription: Oil of mustard, 1 drachm (3.38 grammes); menthol crystal, 2 drachms (7.78 grammes); alcohol, ½ drachm (1.62 grammes); sulphuric ether, 1 drachm (3.38 grammes). This should be poured on a sponge sufficiently large to fill a wide-mouthed ounce (31 grammes) bottle. The mixture should not be used in iritis and some inflammations of the eye.

Adonis Amurensis.—Y. Inoko[273] has obtained a glucoside which he calls adonine, from the Japanese plant, *Adonis amurensis.* This substance is free from nitrogen, amorphous, colorless, of a bitter taste, and soluble in water, alcohol, and chloroform. The symptoms observed on the heart of a frog were precisely those seen when digitaline is used. The author considers it to be about twenty times weaker than the adonidine obtained from the European *Adonis vernalis.*

Agaricin.—Combemale[67 May 30] has used agaric acid, both in the treatment of night-sweats in phthisis and in the sweating due to other pathological causes. Out of 13 cases suffering from pulmonary tuberculosis, 12 received benefit from the action of this medicine. In 5 other cases, including 3 of anæmia, 1 convalescing from typhoid fever, and another of dilated bronchi, success was complete in the first 3 cases, and in the other 2 there was a certain amelioration. The author considers that 2 to 4 centigrammes (2/7 to 3/5 grain) are sufficient to act well in pulmonary tuberculosis, even in advanced cases, or in other pathological sweatings. If the previous digestion be good, no trouble arises from its use in regard to secondary annoying symptoms. If the action of agaric acid be manifested, it will occur at the end of two hours and last during six hours.

Agaricinic acid should be considered, according to Combemale,[67 May 30; 80 July] as the pure principle of the white agaric, and as the only antisudorific element of the drug. It is soluble in alcohol, less so in ether, acetic acid, and cold water. In the 17 cases reported by the author, the acid was found to possess most excellent antisudorific properties, the effect being pronounced not only in tuberculosis, but in other forms of poisoning and infection. This agent, even in the third stage of pulmonary tuberculosis, was able to suppress the distressing night-sweats, its action being manifested in from two to six hours after the ingestion of the drug, and lasting about six hours. No evil after-effects of any kind were observed. The dose employed was from ⅓ to ¼ grain (0.022 to 0.016 gramme), in pill form.

Alcohol.—Hugounenq,[211 Mar.1] in an extremely interesting experimental study regarding the influence exercised by wines on peptic digestion, arrives at the following conclusions: 1. All wines, without exception, retard the action of pepsin; the most pernicious are those which are loaded with alcohol, cream of tartar, and coloring matter. 2. Of the elements of natural wine, the active coloring matters, together with the cream of tartar and alcohol, retard or arrest peptic digestion. 3. The acidity of ordinary wines is powerless to provoke the action of pepsin; in the majority of cases it does not seem to aid it. 4. The coloring matters fraudulently introduced into wines, such as methyl-blue, azoflavine, solid blue, and especially fuchsin, hinder peptic digestion. The vegetable coloring matters, such as black mallow, elder, and makis, exercise a noxious action. 5. In doing away with a part of the cream of tartar employed in the manufacture of ordinary wine, an element which retards the action of pepsin is removed. Digestion is more rapid under the action of plastered wines than under that of the ordinary wines. This advantage may serve as an argument to uphold the good effects of plastered wine upon the organism.

John Eaton[26 Jan.] sums up the legitimate uses of alcoholic stimulants as follows: "1. Although alcohol is not necessary to the adult and is injurious to children and young persons, it has a few legitimate uses in health, as when overwork and worry have produced mental and nervous exhaustion and lowness of spirits, but the limit of strictest moderation must never be exceeded. 2. The risk of the moderate use of alcohol merging into intemperance is so great, and the results of its excessive use are so calamitous, that it should never be used without medical advice or permission. It should always be used in conjunction with food, and light wines or ales should, as a rule, be preferred to the more intoxicating forms of alcohol. 3. As an agent in the treatment of disease it is safest when left to the judgment of the individual medical practitioner, but it should never be prescribed except in extremely feeble conditions attended with imminent risk of failure of the vital powers, or when other stimulants cannot act so effectively, and should always be ordered in definite doses for a limited period, like other medicines. If in hospital practice, when any doubt existed as to the propriety of its use, consultation of the medical members of the staff were held, the result of the treatment would more fully secure the confidence of the public and the profession, and rapidly advance the principles of rational temperance. 4. During the past thirty years the diseases for which alcohol was prescribed have in many instances been treated without alcohol, and the quantity of alcohol ordered in each case, where its use is still retained, has been very much restricted. As time goes on the use of other restoratives instead of alcohol will doubtless continue to increase, and the rush to alcoholic stimulants, like the practice of excessive blood-letting in the treatment of disease, can never again prevail, while both treatments will continue to be resorted to, not by routine or custom, but when experience indicates that they are likely to be really beneficial."

F. E. Yoakum[196, Dec.,'90] says, in regard to the practice of prescribing alcohol: "Let not the erroneousness of a preceding generation, or the foolish prejudices of the present, or a simple routine of prevailing custom allow us to perpetuate and deepen the greatest evil of the age." According to Dupas,[245, No.87] alcohol and alcoholic solutions are effective in the abortive treatment of herpes. Compresses moistened in a solution of alcohol of 90-per-cent. strength, or in one made of 2 parts of resorcin to 100 of alcohol, may be used over the diseased parts. Under this treatment, the herpetic eruption not only disappears rapidly, but the rebellious and painful neuralgias occurring in herpes zoster are easily subdued in a few hours. Joseph E. Winters[51, Dec.,'90] has found that, while champagne usually agrees well with adults, it scarcely ever agrees with children. In infectious diseases, with the exception of diphtheria, the author rarely uses alcoholic stimulants, and even in diphtheria the use of alcohol is not begun on the onset of the disease, but is only used when the circulatory or nervous system demands it. The writer believes that by the use of alcohol we are treating the temperament and not the disease. A. Seibert[51 Dec.,'90] thinks that it should only be used as a stimulant in the acute infectious diseases of children, and then that it should be given in large doses. If possible, alcohol should never enter the body through the stomach, but should be applied to the skin, or given in some gruel by an enema into the bowel. It is stated[137 Feb.] that the chief authorities in New York, among them Delafield, seldom find it necessary to administer alcohol to children under 5 years of age. Diphtheria is the only disease in which there is much difference of opinion in the matter.

J. Morton[239 Feb.] reports a case where a half a pint of "mohwa," taken at one time, produced death on the twenty-fourth day. It is supposed that severe inflammation of the œsophagus and stomach was set up, and, as there was paralysis of the lower extremities, that structural lesions had taken place.

John C. Thorowgood[6 Aug.8] believes in the sedative action of alcohol, thus supporting the opinion of Wilks as to the usefulness of the remedy in some cases of nervous excitement. Thorowgood reports the case of a girl in whom alcohol was able to allay, in a most successful manner, a violent delirious condition. The author, however, calls attention to the fact that alcohol may do harm in pulmonary diseases where there is evidence of overfullness of the right side of the heart. H. Arnott[39 Oct.1] expresses the opinion that alcohol, far from being a stimulant in small quantities, is a narcotic and sedative in *all* doses, and that, both in health and disease, it weakens the vital powers.

N. S. Davis[196 Sept.] writes against the use of alcohol as a remedial agent. After calling attention to the most recent investigations upon the subject, he concludes that alcohol is a poison; that it is in no proper sense a food, either direct or indirect; and that for the purpose for which the drug is employed, such as temporary relief of pain and the production of sleep, there are other medicinal agents more efficient and less objectionable. The author, with good arguments, contends throughout his able paper that the use of alcohol is neither necessary nor proper. Eichenberg[6 Jan.10] has learned, from his experiments, that a small dose of strong alcohol shortens the time that food remains in the stomach by more than an hour and a half. John Aulde[137 Sept.] writes that he has obtained satisfactory results with malt extract in the treatment of faulty digestion. He considers the remedy an excellent tonic and of especial value during the period of convalescence from typhoid fever.

Aldepalmitic Acid.—J. Alfred Wanklyn[6, Feb.14] has found that aldepalmitic acid, recently discovered by him, forms about one-half of the weight of dry butter. Among other properties possessed by this new acid is that of consolidating or gelatinizing alcohol. At a temperature below 5° C. (41° F.) it gelatinizes more than five times its weight of alcohol.

Aliments.—S. Seilikovitch[760, July 11] finds that we have, in our common household food, remedies of great value. Among others are the common herring, especially the roe, which, when taken in the morning, on an empty stomach, proves to be a good expectorant. Common table-salt, as a gargle, is a good remedy for catarrh of the throat; as a snuff, for nervous headache; as a tonic, for the hair; for rheumatism, by rubbing the affected parts; it will stop pulmonary hæmorrhage, and prevent epileptic fits. Lemon-juice destroys a bad taste in the mouth; a decoction of parsley is a good diuretic; honey, mixed with flour, serves to ripen abscesses; thin slices of potatoes, applied to the temples and forehead, relieve headache; the kernels of black olives increase the gastric juices and promote digestion; garlic, cooked with milk, is a good remedy for pin-worms; scraped horse-radish, applied to the nose, serves as a good exciting agent in fainting-fits, and it can also often replace mustard plasters; sweet-oil and the yelk of eggs serve as a dressing for burns; watermelon-juice, abundantly used, is a good diuretic; kerosene is a good washing for scabies; and the soft part of an apple, cooked in red-wine, quiets the pain of piles.

Much doubt has been expressed as to whether klysters of emulsified eggs possess any nutritive value. Armin Huber[826, B.47, H.5, 6] has found that a simple emulsified egg is absorbed, but in very small quantities; while, if common salt be added, the absorption is much more rapid. The klysters were prepared twice daily, and 6 eggs a day were used, the amount of salt added for each egg being 1 gramme (15 grains), a larger amount than this causing a derangement of the rectum. A peptonized egg-klyster was prepared by taking 6 eggs, with 200 cubic centimetres (6½ ounces) of a 0.15-per-cent. salt solution. This was thoroughly mixed, 5 grammes (1¼ drachms) of pepsin were added, and the mixture was put aside for ten hours, at a temperature of 40° C. (104° F.).

From a series of experiments upon himself and upon the lower animals, N. Zuntz[116 Oct.,'90; 2 Mar.,7] has arrived at the general conclusion that even large quantities of chocolate-fats can be taken without producing any derangement of the digestive organs, and that patients could be benefited by such substances, as they are also easily assimilated. C. P. Pengra[187 Apr.] inveighs against the common practice of many manufacturing chemists of adulterating gluten with starch. He considers pure gluten to be not only valuable as a desirable food for the table, but also in the treatment of nervous diseases.

Frank Woodbury[144 June] considers that a diet poor in nitrogenous food is of value in rheumatism, gout, lithæmia, recurring attacks of biliousness and bilious headache, scurvy, and certain forms of skin diseases. In families where there is a tendency to cancer, a vegetable diet might possibly overcome such a tendency. Some nervous diseases, such as epilepsy and chorea, are benefited by the withdrawal of meat from the food. Usually in inflammation (and under this head may be mentioned the various forms of Bright's disease) nitrogenized food is unfavorable. On the other hand, it may be used in cases where there is a deficiency in the albuminous principles in the blood, as in anæmia or chlorosis, in phthisis, eczema in infants or sewing-women, in diabetes (here to avoid the use of carbohydrates) and in growing children. He calls attention to the fact[61 July,4] that in children, during the period of growth and development, more nitrogen is required than after the body has assumed its full stature. Therefore, school-children should be allowed meat and encouraged to partake largely of vegetables, such as oatmeal, corn, beans, peas, and others known to contain a considerable amount of nitrogen. A. Denaeyer,[6 May,2] by a new process of analysis, finds gelatin to be a common constituent of commercial peptone of meat. It is also stated that it is not identical, chemically or physiologically, with either peptone or albumoses, and that it has a greater percentage of nitrogen than either of these bodies. It would, therefore, seem to be of the greatest importance to estimate the amount of gelatin in all preparations of peptone and albumoses, so extensively used as nutrients.

Jonathan Hutchinson[806 Jan.] considers that nothing would be so conducive to the improvement of the health of children, especially of the tuberculous, as an increase in the consumption of freshly-made butter.

At a recent discussion before the Bordeaux Society, following a paper read by Carles,[188 Jan] the subject of exclusive milk diet in many cases of disease, was brought up. Davezac stated that he was unable to support the opinion generally held, that milk diet was indicated in parenchymatous nephritis. In these cases he has used broths and has never observed untoward effects. With regard to feeding in acute diseases, J. F. White[568 May] holds that patients should not be fed until the crisis has passed, and that they should then be allowed to have whatever they desire. The physician, guided by a knowledge of the pathological condition, should heed the demands of nature.

C. C. Vanderbeck,[77 Jan] favors medication by the rectum, not only in the form of suppositories, but also by means of injections. As regards the excipient, he recommends the soft and flexible glycerin-jelly as being readily dissolved and absorbed in the rectum. From investigations made by H. Weiss,[202 Jan 10] the following properties are attributed to kefir: The substance equals milk plus alcohol, carbonic acid, lactic acid, and hemialbuminose, or propeptone. It is said to promote diuresis, and, although it has no specific therapeutic virtues, is a readily assimilable nutrient, acting both as a tonic and as a stimulant. Patients, under its use, gain in weight. It has rendered good service in a variety of diseases, being especially valuable in ulcus ventriculi, Bright's disease, and scurvy. The best kefir is that prepared from cows' milk. The author suggests its use in alcoholism. From a series of carefully conducted experiments upon animals; with a view of testing the therapeutic value of peptic hydrochloric acid, Richet[196 May] reaches the following conclusions: (1) it is during digestion that the gastric juice has the most need of hydrochloric acid; (2) when this acid is deficient, the proportion of pepsin is diminished; (3) to administer to a patient pepsin without being sure that this pepsin will find a sufficient quantity of hydrochloric acid in the stomach with which to combine itself and to act upon the alimentary matters is to certainly check digestion; (4) the two principal elements for the physiological act which constitutes digestion being hydrochloric acid and pepsin, it is well indicated to administer this acid combined with pepsin. Sundari Mohan Das[239 Dec.1,'90] looks with favor on vegetable food, and thinks that rice or rice-soup is better than sago or barley, in the treatment of invalids suffering from bowel complaints and febrile disorders.

In considering the therapeutic uses of *fel bovis inspissatum*, W. H. Porter,[9 May 2] comes to the general conclusion that ox-gall is indispensable in the treatment of almost every pathological condition, especially in patients that are in the decline of life. He insists upon the fact that ox-bile stimulates a more active flow and an improved quality of pepsin, and, by producing a perfect peptonizing action upon the proteids, the work of the pancreatic and intestinal juices becomes considerably diminished. Another good property attributed to ox-bile by him is that of softening and removing fæcal matter from the colon in cases of chronic constipation. For this purpose he has used, with success, the following, as a rectal injection:—

℞ Inspissated ox-bile, ...		f℥j	(30 grammes).
Glycerin, ...		f℥iv	(148 grammes).
Castor-oil, ...		f℥ij	(108 grammes).
Water, ...	q. s. ad	f℥viij	(240 grammes).

Sig.: This to be added to a pint, or, better still, a quart (480 grammes) of warm soap-suds; the larger amount can be retained when injected slowly into the bowel.

Excellent results have been obtained by F. Woodbury,[80 Dec.,'90] by the use of peptonized beef-powder, in cases of prostration and the effects of fatigue in elderly persons, and in infantile debility following bowel disorders. A pure gluten preparation has been used by C. P. Pengra,[115 May] with excellent results, in migraine, insomnia due to nervous debility, in incontinence, and particularly in cases of spermatorrhœa.

Chittenden[80 July] condemns as worthless all the best-known beef preparations in the markets, for, setting aside their value as stimulants, they contain no nutritive properties. He believes, on the contrary, that preparations which contain partially digested beef-fibre, reduced to powder by desiccation, are possessed of considerable nutritive power and should be preferred. He also calls attention to the fact that better results are obtained if small quantities of food are given at sufficient intervals in cases of wasting disease. Several cases are reported by Golinger[202 Aug.25] in which beef-meal produced the best results as a nutrient. Added to soups or chocolate, he asserts that the meal has a pleasant taste; 8 grammes (2 drachms) of the preparation, which corresponds to 48 grammes (1½ ounces) of the crude beef, is said by the author to be sufficient for the ordinary meal of an adult.

W. Prausnitz $^{34}_{\text{May 5}}$, has made thirteen experiments on persons who had abstained from food for two days, in order that he might test the deductions of von Pettenkofer and Voit in regard to the decomposition of albumen in the human body, estimated by the amount of nitrogen liberated from the urine. Excluding one case, the average weight of those experimented on was 71.6 kilogrammes (156 pounds). On the second day of the fast there were 13.7 grammes (3½ drachms) of the nitrogen evolved, which would show a replacement of about 70 grammes (2½ ounces) of albumen in each person.

Alkalies.—In four cases of universal pruritus the best results, according to C. Lange, $^{245}_{\text{Oct.}}$ have been obtained from the combined use of bicarbonate of sodium and carbonate of lithium, after all other known remedies had failed.

Alkaloids.—Domenico Marinucci $^{580}_{\text{Oct. 25}}$; $^{2}_{\text{Oct. 31}}$ has been making some interesting experiments in regard to the microbes contained in the usual medicines used hypodermatically, and the method of sterilization of such medicines. He finds (1) that, while all preparations studied contain microbes, all these microbes are not harmful; (2) that sterilization by heat does not alter solutions of strychnine, curare, bihydrochlorate of quinine, or borate of eserine. It enfeebles, but does not alter the character of morphine and atropine. After sterilization, however, these drugs must be used in larger doses. The sulphate of eserine was found to be seriously altered, so that the solutions were in a great measure rendered inert; (3) that to those solutions which are altered by heat, corrosive sublimate should be added in the proportion of 1 to 10,000. This seems to be efficacious, and in no way to injure the value of the alkaloid when given hypodermatically. A. J. Ferreira da Silva $^{3}_{\text{June 10}}$ finds that the ammonium sulphoselenite not only gives a green coloration with morphia and codeine, but also with other alkaloids, such as berberine, eserine, narcotine, papaverine, solanine, and narceine. With narceine the deposit only occurs after standing two or three hours. With eserine the reaction only takes place when this drug is in a pure state. B. Dupuy $^{153}_{\text{July 28}}$ has studied the action of 130 alkaloids, giving a complete history of each, its physical and chemical properties, mode of preparation, physiological action, therapeutic effects, mode of administration, dose, uses, and toxicology. W. L. Coleman[186 May] favors the use of the alkaloids in medicine, as, for example, the employment of frequently repeated small doses of aconitin.

Aloes.—John Aulde[59 Dec.6,'90] recommends aloes in small doses as the best drug for the treatment of habitual constipation. He lays much stress upon the formula of a celebrated physician of Wiesbaden, which is as follows: Spanish saffron, 20 grains (1.3 grammes); Socotrine aloes, *Boletus laricis*, and powdered myrrh, each 1 drachm (3.89 grammes); powdered rhubarb, powdered angelica-root, zedoary-root, gentian-root, and calamus-root, of each, 2 drachms (7.78 grammes); brandy, sufficient quantity to make 2 fluid pints (1 litre). Of this mixture 8 or 10 drops can be taken after meals, in wine or dropped on sugar. As a purgative, half a teaspoonful at bed-time, or twice daily, according to indications, should be given.

Ammonium Chloride.—When this drug goes into solution cold is produced.[284 May] This means of producing cold has occasionally been employed as a refrigerant to the head. Besides its usual uses ammonium chloride is recommended internally in neuralgia, myalgia, and chronic rheumatism. An ulcerative condition of the stomach is said to follow continued large doses.

Amyl Hydrate.—For the administration of this drug the following formula is recommended[296 No.3]: Hydrate of amyl, 1 drachm (3.89 grammes); water, 2 ounces (60 grammes); orange-flower water, 2 ounces (60 grammes); syrup of bitter orange, 1 ounce (31 grammes). Of this mixture one-half may be taken at night. The drug may also be taken in capsules, in doses of 1 drachm (3.89 grammes).

Anemonine.—The name of *anemonine* has been given to the active principle of wood anemone, recently extracted by Dupuy.[296 July 8; 80 Oct.] It occurs in crystalline needles, and when given in large doses it produces poisonous effects, such as bloody diarrhœa, hebetude, and death from paralysis. It is said to be useful in catarrh, chronic bronchitis, and in whooping-cough, and to possess emmenagogic virtues.

Aniline.—Combemale,[67 Apr.'90] in a powerful study, has examined, experimentally and clinically, the physiological and therapeutic properties of methyl-blue. He has found the fatal dose in guinea-pigs to be 3 decigrammes (4$\frac{3}{5}$ grains) per kilogramme (2$\frac{1}{2}$ pounds) of the body-weight. Half an hour after the hypodermatic injection of this dose the animal staggers, falls to one side helpless, but evinces a marked increase of the reflexes. After death the following general effects are produced: (1) a chocolate discoloration of the blood and a rapid coagulation; (2) flaccidity of the heart and pulmonary atelectasis; (3) engorgement of the liver and a blue discoloration of the bile and the biliary ducts; (4) congestion of the mesenteric vessels, with the same discoloration, which is also noticed in the gastric and intestinal mucous membrane; (5) a central irritation of the kidneys. The drug has two principal actions: one local and strongly irritant, and one general, characterized by a sedation of both motor and sensory nerves. Combemale studied the influence of the drug in 27 clinical cases, in which pain was the most prominent symptom. Complete relief was obtained in 15 cases, amelioration only in 7, and in 5 the drug failed to produce any effect. The successful cases were those of neuralgias of unknown cause, of neuritis of alcoholism, of ataxia in the second period, and of bone-pains of tubercular, syphilitic and traumatic origin. Methyl-blue relieved, without destroying entirely, certain neuralgias, the pains of sclerosis of the spinal cord and those of subacute articular rheumatism. Finally, the drug failed to act in the neuralgias of hysteria, in the lancinating pains of the cachectic period of tabes, and in those of acute articular rheumatism. The drug was usually given in doses of 20 centigrammes (3$\frac{1}{10}$ grains) a day, never beyond that amount. The untoward effects most commonly, although not frequently, observed were cephalalgia, nausea, and diarrhœa. The medicament, then, may be considered chiefly as an analgesic. Combemale$^{3}_{\text{May 6}}$ does not accept the theory of Ehrlich and Leppmann, that its analgesic properties depend upon an elective affinity for the axis-cylinder of the nerve. He has shown, by his experiments on dogs, that a condition of methæmoglobin is produced, and that the freedom from pain is due secondarily to this altered condition of the blood. Methyl-violet has been used with success by Hugounenq and Eraud$^{108}_{\text{Mar.15}}$; $^{2}_{\text{Sup., Mar.28}}$ as antiseptics in the treatment of soft chancre, whitlow, and anthrax. In order to obtain satisfactory results, strong solutions must be employed. In gonorrhœa, for example, complete success was observed by injections of from 1 in 150 to 1 in 100 solutions ten or fifteen times a day. If only 3 or 4 injections are used, no effect at all is produced in the course of disease, in one way or another.

Edgar Stevenson[6, Apr.18] gives a *résumé* of J. Stilling's second and more complete article on the aniline dyes as antiseptics. The following preparations are used by Stilling: 1. Pure methyl-violet.—To be used as a powder for large wounds and ulcers. 2. Large pencils.—For small wounds, burns, etc. For purulent cases the blue pencil is better than the yellow, on account of its greater antiseptic properties. 3. Small pencils.—For application to the eye, in cases of corneal ulcer, etc. 4. Powders.—Of 1 in 1000 strength for mild cases of conjunctivitis, and for more severe cases (blennorrhœa) of 2-per-cent. strength. These can also be used as a snuff in affections of the nasal mucous membrane. 5. Ointments.—In strength varying from 2 per cent. to 1 in 10. 6. Solutions.—Used in strengths of 1 in 1000 to 1 per cent. The 1 in 1000 solution is to be used for ordinary cases of conjunctivitis, keratitis, etc., and in non-purulent cases the yellow dye auramin may be used, on account of its cooling properties. The solutions should be filtered and kept in dark-glass bottles, and changed every eight days. In all cases it is of importance that the different preparations are absolutely pure. A. Buchwald[41, Jan.8] reviews the work of Stilling, Jaenicke, and Neisser on the use of pyoktanin, but adds nothing original. Mosetig-Moorhof[22, Apr.1] has had marvelous success in the treatment of malignant growths by means of the injection of the aniline coloring matters. He advises those practicing this treatment to use a solution of 1 part of methyl-violet in 500 of water as being the best dilution. This should be filtered through asbestos before use. Three to 6 grammes ($\frac{3}{4}$ to $1\frac{1}{2}$ drachms) may be injected directly into the part, the smaller dose being probably more suitable. A. Ceccherelli and M. Bellotti[2, Sup., Aug.23] have successfully employed pyoktanin in various cases of malignant growths.

F. C. Hotz[115, Jan.] thinks the best method of application in corneal affections is in substance. He finds the drug an antiseptic in minor wounds. M. L. Harris,[115, Jan.] in a discussion of Hotz's paper, said that he had brought pyoktanin in contact with almost every tissue in the body, from the brain to the synovial membrane, with the exception of the eye, and, after a thorough trial, looked upon it as very useful. H. Kraus[336, Aug. 22] has not had success in the use of pyoktanin in 12 cases, 6 of which were carcinoma. H. J. Boldt[61, July 11] uses a 1-per-cent. watery solution in cleansing out stitch-hole abscesses. He also uses it in the treatment of endometritis, and finds no irritation to occur from its use.

Frédéric F. Burghard[6, May 23] has especially used methyl-violet in the treatment of gonorrhœa and ulcers. Of 45 cases, 30 were cases of gonorrhœa in the various stages; 13, ulcers, wounds, and boils; and the remaining 2 were cases of malignant disease so far advanced that operation was not practicable. He considers the dose in gonorrhœa to be 1 to 3000. This is weaker than that recommended by Stilling, but Burghard believes that pain and an increase in the amount of discharge may be caused by using a stronger solution at first. It can, however, be gradually increased in strength. He considers pyoktanin very efficacious in the treatment of ulcers, and especially applicable to an out-patient practice.

Korn[4, Feb. 9; 112, June] thinks that the result of the treatment of suppurating wounds by pyoktanin is the same as that by iodoform. Three cases of leg-ulcers of long standing were cured by the application of an ointment. The objection that it stains everything with which it comes in contact can be overcome by the careful disinfection of the hands with bichloride, and the employment of the powder, stick, or ointment of pyoktanin. O. Wanscher[9, Apr. 23] has used pyoktanin, blue and yellow, over 1000 times, in 50 cases, with favorable results. Du Pré[276, May 30] has used it in 3 cases of epithelioma of the face and in 2 cases of carcinoma of the uterus, which were inoperable. The results were absolutely negative, both as to cure and alleviation. Galezowski, with the aid of Petit,[3, Dec. 31, '90] has obtained from aniline a body having properties absolutely identical with those of pyoktanin, the chemical name being tetramethylo-diapsido-benzo-phenoneide. He proposes to call this substance benzo-phenoneide. It is soluble to the extent of 1 per cent., and in this proportion is neither caustic nor irritating in its action. It possesses marked antiseptic properties, and is said to be very efficacious in affections of the cornea. Le Dentu[164, May 7, 21] has used pyoktanin hypodermatically in 3 cases of epithelioma of the eyelid, 1 of cancer of the tongue, and 1 of cancer of glands in the neck, with unsatisfactory results in all. He found that the drug would soften the centre of tumors without affecting the periphery in any way whatever.

J. H. Chamberlin $^{105}_{\text{Apr. 25}}$ hopes to obtain better results from the combined use of boracic acid and pyoktanin than with pyoktanin alone. Quénu $^{3}_{\text{May 13}}$ has not had success with the use of injections. V. Sehlen $^{28}_{\text{June}}$; $^{2}_{\text{Sep., July 25}}$ reports a case of ulcerating carcinomatous tumor of the right cheek, in which, resorcin plasters proving of no avail, he applied pyoktanin in substance. At first this caused much pain, and it was necessary to apply compresses of cocaine-antipyrin. Within five days the secretion had diminished and the ulcer became flatter, cicatrization finally taking place. Max Einhorn $^{82}_{\text{May 30}}$ reports a case of carcinoma in a woman whom he treated for three weeks with methyl-blue. The patient was far advanced in the disease, and had ascites and œdema of the legs, no appetite, pulse 110 to 120, great pains, frequent nausea, and insomnia. Methyl-blue was given in 0.2-gramme ($3\frac{1}{10}$ grains) doses three times a day. In two weeks improvement was noticeable; appetite returned and insomnia disappeared. Œdema also disappeared five days later, and the pulse was reduced to 80 a minute and became strong. Two other cases, one of cystitis and the other of pyelitis, are also reported, in which success was obtained from the use of the same drug. Attention is directed by Leppmann and Ehrlich $^{69}_{\text{No. 23, '90}}$; $^{6}_{\text{Jan. 10}}$ to the analgesic properties of methyl-blue, both when given hypodermatically and by the mouth in capsules. The drug acted remarkably as an anodyne in neurotic and rheumatic affections. The effects were purely analgesic, as the remedy had no action on inflammatory conditions. It was of value in angiospastic migraine, the analgesic effects becoming apparent about two hours after the ingestion of the drug. The doses, by the mouth, varied from 0.1 to 0.5 gramme (1½ to 7¾ grains) and even 1 gramme (15½ grains) a day. For hypodermatic use the drug was administered in less than 0.05 cubic centimetres (⅘ minim) of a 2-per-cent. solution. Even after the smallest quantities the medicament was eliminated by the urine, which in an hour appeared of a bright-green, in two of a dark-green, and in four of a dark-blue color, but contained no albumen nor any abnormal constituent. Methyl-blue was found to possess no antipyretic properties. It has been successfully employed by Flavel B. Tiffany $^{61}_{\text{Feb. 28}}$ in two cases,—one of irido-cyclitis and another of choroid cyclo-iritis. In the first case it was combined with atropia, and the author believes that the latter substance could not have produced its mydriatic effect without the aid of the methyl-violet, and that, besides, the methyl-violet was able to control the irritating action of the belladonna alkaloid on the cornea, and to check the keratitis. In the second case equally good results were obtained, as well as in a third case of suppurative iritis which had resisted all other treatment. Methyl-violet has also been successfully employed by Tiffany in ulceration of the cornea and in marginal blepharitis, or tinea tarsi. It may be used as a local, topical, and general systematic agent, in fluid or ointment, in the strength of from $\frac{1}{20}$ to 1 per cent. Le Roy Dibble[72 Oct.] writes that a patient suffering from osteo-sarcoma of the superior maxillary, reported[102 Sept.] as apparently cured by the use of methyl-violet injected directly into the diseased tissues, died one month later from the disease. Methyl-blue has been found by Galliard[17 Apr.30; 151 July] to be poisonous, even in small doses. In doses of $1\frac{2}{3}$ to $3\frac{1}{3}$ grains (0.109 to 0.21 gramme) by the mouth, it produced general malaise, painful sensations, and albuminuria. Larger quantities aggravate these symptoms and also produce gastro-intestinal irritation. It is much inferior to analgesin in the treatment of functional nervous disorders.

Animal Extracts.—In a new communication to the Société de Biologie, Brown-Séquard[3 Oct.21] affirms that he has obtained good results from injections of testicular liquid in cases of ataxia, hemiplegia, diabetes, and even pulmonary tuberculosis. Onimus[3 Sept.] has used the injection of cardiac muscle, in a case of asystole, with amelioration of the symptoms. In a typical case of labio-glosso-laryngeal paralysis, an injection of nervous material caused a great improvement, as it also did in 2 out of 3 cases of transverse myelitis. D. Mendelejeff[21 Dec.13,'90] states that the spermine of A. Poehl is the true spermine, and that that of a certain manufacturer which has been put upon the market cannot be considered a spermine, but is the well-known preparation diethylendiamine, or piperazidin. Lassar-Cohn[69 Oct.8] believes that the formula is not C_2H_5N, but, on account of the vapor density, is twice that, or $C_4H_{10}N_2$. Therefore, the hydrochloride of piperazin is nothing more than a combination of diethylendiamin. Poehl considers the true formula to be $C_{10}H_{26}N_4$. Roshtchinin[25 May] has used Poehl's spermine in nervous affections, diabetes mellitus, pulmonary tuberculosis, and collapse, and thinks that a brilliant future is to be predicted for it, and that though it is not a specific remedy, either for diabetes or tuberculosis, it certainly gives beneficial results, almost identical with those of Brown-Séquard's testicular emulsion, while it can be so much more easily and conveniently administered. An editorial writer[19, Apr.25] states: "We incline to the opinion that spermine is an agent better suited to the use of persons of an imaginative turn of mind and sanguine disposition than to that of calm and critical practitioners."

Antifebrin.—See Acetanilid.

Antikamnia.—A fatal case of poisoning is editorially reported,[224, Sept.12; 1, Oct.17] which is alleged to have occurred from the administration of antikamnia. An apparently robust woman of 22, suffering from headache, took, without medical authorization, 24 grains (1.55 grammes) of antikamnia. Acute delirium and loss of consciousness soon occurred, ending in fatal coma in about ten hours from the time of the administration of this drug of unknown composition, but supposed to be made up of acetanilid and bicarbonate of sodium. The post-mortem examination showed no organic lesion sufficient to account for death. The greater portion of the body was cyanotic.

Antimony.—It has been held by Hufeland that antimony, in substance, is superior to all other preparations in the treatment of obstinate herpetic eruptions dependent upon scrofulous vice. J. A. Thacker[275, May] cites, from the above author, the following remarkable case:—

A little girl, born of scrofulous parents, had presented in her infancy the unequivocal symptoms of the scrofulous diathesis; she still had swollen glands on her neck and eruptions on the arms and face. The eruption was dry, scaly, and sometimes resembled tinea. A great variety of remedies, both internal and external, had already been made use of, without success. Antimony in substance was then prescribed, in doses of 1 scruple (1.30 grammes), three times a day, with an absorbent powder, sugar, and canella. The dose was gradually increased until the patient took half an ounce (15.5 grammes) of the drug every day. Sulphurous baths were also applied. The cure was completed in about six weeks, and, although slight relapses occurred, these yielded promptly to the same means. Jonathan Hutchinson[806, Jan.] believes that small doses of tartar emetic, long continued, are decidedly favorable* to the subsidence of all local congestions.

Antinervine.—This remedy, recently introduced, is composed of salicylanilid and bromo-acetanilid, and has, according to F. de Filippi,[580, Sept. 3] given good results in various forms of neuralgia in which antipyrin and phenacetin have totally failed. The dose is set down as 1 gramme (15½ grains), which is sufficient to relieve the pain in from five to six hours.

Antipyretics.—With regard to the action of antipyretics, Bernheim,[107, Aug.] believes that the analgesia produced by them is closely related to their antithermic action, being brought on through an influence exercised on some nervous centre, probably located in the gray matter of the brain. The author even denies the specific action of quinine in malaria. Antipyretics, according to him, should be used only to reduce an abnormally increased algesia, or in cases in which a high temperature involves a special danger. According to Demme,[650, Jan. 1; 161, Mar.] who has made a careful study of the subject, the acute febrile disturbances incidental to the period of childhood are better treated by hydropathic means than by the exhibition of antipyretics. The diseases most influenced by these drugs were found to be typhoid, acute rheumatic polyarthritis, and persistent broncho-pneumonia. It is preferable to exclude the remedies altogether in the acute exanthemata, such as measles, scarlatina, etc., and in diphtheria and simple croupous pneumonia. In exceptional cases the use of the antipyretics is justified.

Antipyrin. — R. Saint-Philippe[188, July 19] has employed antipyrin extensively in the treatment of diarrhœa in children, and from the results obtained formulates these conclusions: (1) Antipyrin is the remedy to choose for the treatment of infantile diarrhœa; (2) it acts on all forms of the disease, particularly on those of a dyspeptic, painful, or reflex nature; (3) it is easily absorbed and tolerated, and should replace all other antidiarrhœic remedies; (4) it resembles morphine in its physiological action, and, of course, is to be preferred in cases in which the alkaloid of opium is inapplicable; (5) there is no contra-indication to its use, except that it should be given with care in young subjects. Its ingestion in the form of effervescing salts, such as is now used in the case of magnesium and lithium salts, is proposed by Hicks.[100, Jan. 29] It is claimed by the author that, in this form, antipyrin is by far more acceptable to the stomach, and does not cause nausea and vomiting or vertigo. Its administration, even in children, is greatly facilitated, one of the greatest drawbacks, the intolerance of the drug by the stomach, being thus destroyed. When necessary to use an antipyretic, in the febrile diseases, especially of children, Demme$^{650}_{\text{Jan. 1;}}{}^{161}_{\text{Mar.}}$ has found antipyrin to give the most satisfactory results. He has employed it with success in cases of broncho-pneumonia, particularly in the early stages of the disease, in exanthemata, and in grave cases of diphtheria. The medicine seldom produced nausea and vomiting, or even loss of appetite. It was given as follows: For children 2 to 4 years of age, 0.2 to 0.4 gramme (3$\frac{1}{10}$ to 6$\frac{1}{6}$ grains); 5 to 10 years, 0.5 to 0.75 gramme (7$\frac{3}{4}$ to 11 grains); 11 to 15 years, 0.8 to 1.0 gramme (1$\frac{1}{4}$ to 15$\frac{1}{2}$ grains). These doses were administered every hour until three or four were taken, which were generally sufficient to reduce the high temperature, without producing untoward effects.

From an extensive trial of the drug, H. Reding$^{139}_{\text{Dec.,'90}}$ regards antipyrin as the analgesic *par excellence* in painful affections. In headaches, of whatever origin, and in the omnipresent pains of influenza, the remedy has always acted like a charm. In dysmenorrhœa of nearly all forms, especially the congestive type, from which girls and young women suffer so frequently, antipyrin was the best remedy employed. A powder of 15 grains (1 gramme) of antipyrin, combined with $\frac{1}{6}$ grain (0.011 gramme) of morphine, was sufficient to avert all suffering. Similar results were obtained from the use of a like combination (8 grains—0.52 gramme—of antipyrin to $\frac{1}{8}$ or $\frac{1}{6}$ grain—0.008 to 0.011 gramme—of morphine) in the treatment of facial and supra-orbital neuralgia of a periodical type. The drug also gave good results in relieving the pains of acute rheumatism, and seemed to act well in some cases of headache from irritable stomach, though it was not so efficient in controlling the paroxysms of gastralgia. According to Saint-Hilaire,$^{136}_{\text{Aug.15}}$ antipyrin exercises a decided local anæsthetic power, and is thus of value in affections of the mucous membrane of the nose, pharynx, and larynx. It has produced anæsthesia of the cornea, lasting for more than two hours. The author employs a solution of 1 part of the drug to 2 or 3 of the liquid used. H. Guibert$^{3}_{\text{July 8;}}{}^{673}_{\text{Aug.}}$ confirms the previous observations of Ryan-Tennison in regard to its antigalactagogue properties. In 19 cases of newly-delivered patients, the drug produced a suppression of the lacteal secretion, and no evil after-effects were noted. The dose employed was 0.25 gramme (3⅞ grains) every two hours, the secretion being arrested in from two to six days. Twenty-nine cases of nervous movements and inflammations resulting from laryngeal troubles are reported by Coupard and Saint-Hilaire[11 Mar.] as cured under the influence of antipyrin. The authors, likewise, assert that suffering in phthisis is diminished by its use.

Charles S. Potts[112 No. 1, '90; 99 July 28] reports 43 cases of idiopathic epilepsy, in which the most excellent results were obtained by a combination of antipyrin and bromide of ammonium, as first suggested by H. C. Wood. The combination did not fail to give relief in a single one of the cases reported, and neither bromism nor the disagreeable effects often produced by antipyrin were observed. The dose employed in adults was 6 grains (0.39 gramme) of antipyrin and 20 grains (1.3 grammes) of bromide of ammonium three times a day. Perret and Givre[211 June 7], have been studying the amount of time required for the elimination of antipyrin in children in relation to that of middle and old age. Their conclusions are that, no matter what the age may be, elimination by the urinary tract began at the same time, varying from three-quarters of an hour to one hour. It was found, however, that the elimination in the child is finished more rapidly than in the adult, and more rapidly in the adult than in the old man. The conditions causing accumulation in the system do not influence in any manner the time of the appearance of antipyrin in the urine, but notably increases its duration. Children suffering from whooping-cough or enuresis, varying in age from the second to the fourth year, supported readily daily doses of 1½ to 2½ grammes (23 to 38 grains). Children with chorea bore readily 4 to 5 grammes (1 to 1¼ drachms) in a day without being in any manner inconvenienced. A case is also recorded in which a ½-gramme (7¾ grains) dose produced a general eruption, lasting for several hours. John Ernest Moffitt[267 Apr.] reports the case of a man who, as a consequence of a traumatic injury of the cervical vertebræ, exhibited, in the course of two days, a temperature of 105.4° F. (40.8° C.). Antipyrin, in a dose of 12 grains (0.78 gramme), failed completely to reduce the temperature. According to Millard and Campbell,[59 Aug. 8] the following substances produce precipitates when added to aqueous solutions of antipyrin: Carbolic acid in saturated solution, tannin (a white insoluble precipitate), mercuric chloride (a white precipitate soluble in an excess of water), infusion catechu, infusion cinchona-bark, infusion rose-leaves, infusion uva ursi, solution of extract of cinchona-bark, tincture of catechu, tincture cinchona, tincture hamamelis, tincture iodine (a precipitate soluble in water), tincture kino, tincture rhubarb. The following substances produce coloration when added to aqueous solutions of antipyrin: Hydrocyanic acid, dilute solution, yellow; nitric acid, dilute solution, weak yellow; ammonium alum, dilute solution, dark yellow; amyl nitrite, acid solution, green; nitrous ether, alcoholic solution, green; copper sulphate, green; ferrous phosphate, yellow brown; ferric sulphate, blood red; ferric chloride, blood red; syrup iodide of iron, red brown. Walter P. Ellis $^{80}_{\text{Sept.}}$ calls attention to the incompatibility of tannic acid and antipyrin.

B. Martin $^{17}_{\text{Oct. 20, 22, 27}}$ writes about the contra-indications for the employment of antipyrin, such as a weak heart; diphtheria, with phenomena of myocarditis; after profuse hæmorrhages; in debilitated subjects, convalescence from chronic fevers, and the night-sweats of tuberculous patients. The use of atropine in the treatment of poisoning by antipyrin, recommended by some, is equally condemned by other authorities; but, of course, in collapse stimulants have given the best results. A peculiar rash is described by Veiel, $^{45}_{\text{H.1}}$; $^{2}_{\text{Sup., Apr. 11}}$ as occurring in a patient soon after the ingestion of antipyrin. At first there was severe itching of palms of the hands, lips, soles of feet, and glans penis, followed by the formation of bullæ on the lips, hard palate, and between the toes. Urticaria-like spots, with sharp contours, appeared on the soles and palms, but did not form bullæ. The itching lasted three or four days; the bullæ on the lips dried in from four to five days; the spots desquamated by the tenth day, and in three weeks entirely disappeared.

R. L. Watkins $^{1}_{\text{Sept. 19}}$ reports a case of poisoning, in a woman 30 years of age, after a dose of about 20 grains (1.3 grammes) of antipyrin. The symptoms were those of collapse and the appearance of an eruption of white blotches. The after-effects persisted for two months, and consisted of great debility, palpitation of the heart, the occasional appearance of the eruption, and a peculiar weakness of the sterno-cleido-mastoid muscle. The patient finally recovered under the use of stimulants. Two cases have been reported to the Académie de Médecine, by Verneuil,[3, Nov. 4] in which the hypodermatic use of antipyrin was followed by gangrene of the extremities. The author believes that these results depend upon a peculiar predisposition of certain nervous and vascular conditions of the tissues, especially at the region where the injections are practiced. Such injections are particularly injurious where neuritis is the chief pathological lesion.

A case of poisoning by antipyrin is reported by Biggs,[1, Jan. 10; 112, Mar.] occurring in a middle-aged man who took 60 grains (3.89 grammes) of the remedy, in divided doses, in the course of thirty hours. The symptoms were renal in nature,—albuminuria; dark, olive-green urine, of high specific gravity, with red corpuscles and hyaline casts. The patient recovered entirely. Grancher[212, May 10] reports a case of chorea, in a child 8 years of age, in which the ingestion of antipyrin gave rise to a morbiliform rash, with an elevation of the bodily temperature. The eruption especially affected the face, in which it exhibited a discrete form, and the outer surface of the extremities. The rash would disappear on the stoppage of the medicine, and re-appear on its renewed ingestion.

Antiseptics.—J. J. Berry[99, Aug. 6] concludes (1) that the internal use of germicides is valueless in most cases of systemic infection. While they may alleviate the symptoms, they possess no curative properties. 2. That such agents have, to a certain degree, a beneficial effect upon acute gastro-intestinal diseases, and are of some value in those of a more chronic course. 3. That their remedial action is not always due to their antiseptic properties. 4. That systematic as well as local disinfection is effected far better by eliminatives than by germicides. According to Th. Omelchenko,[586, No. 7, 9] the vapors of the ethereal essences possess disinfectant properties, appearing to act especially upon the bacilli of typhoid fever, tubercular disease, and carbuncle. The strength of these vapors is placed by the author in the following order: Cinnamon, fennel, lavender, cloves, thyme, peppermint, aniseed, myrrh, menthæ crispæ, eucalyptus globulus, camphor, valerian, eucalyptol, turpentine. The essences of rectified lemon and of rose act feebly in the form of vapors.

Apocodeine.—William Murrell[26, May] is quoted as finding apocodeine to be prepared in the same manner as apomorphine, and to act as an expectorant in doses of about double those of apomorphine, but not to be an emetic when injected hypodermatically.

Apocynum Cannabinum.—W. T. Richmond[143, June] considers the fluid extract of apocynum Gannabinum, in doses of 7 to 8 drops, to be useful in the treatment of dropsies. Such a dose, repeated at short intervals, if necessary, will cause copious watery discharges from the bowels, and the flow of urine will be increased. As tolerance is established by continued use, it is necessary to increase the dose when given for a long time.

Apomorphine.—Several interesting observations in regard to the therapeutic uses of this drug have been made by J. S. Horsley.[59, Dec.6,'90] Four illustrative cases are reported, in which the drug was effective in preventing and controlling convulsions and other motor disturbances. In 1 case of strychnine poisoning, the drug, in doses of $\frac{1}{15}$ to $\frac{1}{10}$ grain (0.0043 to 0.0065 gramme), subcutaneously injected, completely subdued the convulsions, and, eventually, successfully antagonized the excitant alkaloid. Apomorphine has been similarly employed by the writer in a large number of minor hysterical phenomena, and he refers to a case of convulsions of this nature, in which the remedy gave prompt relief. The amounts used varied from $\frac{1}{8}$ to $\frac{1}{20}$ grain (0.0081 to 0.0032 gramme), hypodermatically administered, and were never followed by any alarming symptoms. On the whole, the author affirms (without attempting to explain its mode of action) that apomorphine is capable of arresting spasm when present, and of preventing it when about to occur.

William Murrell[26, May] is quoted as authority for the statement that apomorphine may be given in repeated doses up to 5 grains (0.32 gramme) a day without even inducing nausea, producing only free bronchial expectoration. Q. C. Smith[85, Apr.] considers apomorphine, mixed with lanolin and applied to the skin, as a most valuable expectorant. For infants the strength is 1 grain to 1 ounce (0.065 to 31 grammes), the ointment being rubbed over the body three times a day, the skin being previously thoroughly cleansed.

Argemone Mexicana.—According to F. Semeleder, corresponding editor, Mexico, the juice of this plant, belonging to the Papaveracea family, is said to have the odor and taste of opium, and to contain morphine.[792, Apr.; 673, Sept.] A yellow, transparent, clear oil, liquid at 3° C. (37.4 ° F.), is yielded, having a sharp flavor and a nauseating odor.

Aristol.—Schmitt[184, May 1] reports another series of 40 cases, in which he somewhat modifies the unfavorable opinion of aristol given in his first series of 40 cases. He still finds it useless in syphilitic and tubercular ulcerations, but states that it is incontestably of great value in the cicatrization of simple ulcers. He considers it to be superior, in these cases, to iodoform, as regards its rapidity of action, its harmlessness, and the facility with which it is applied. From the local application of the drug in 3 rebellious cases, Seuvre[577, Feb.] concludes that aristol, as a cicatrizant and resolvent, is as inoffensive as it is prompt in its action. A study of the value of this agent in the treatment of eczema, psoriasis, and favus has been recently made by Weissblum,[169, May; 80, June] olive-oil, vaselin, or lanolin being employed as vehicles for the drug. With vaselin it was used in the strength of 20 and 10 per cent. In severe cases of psoriasis, it was found to be of little or no value, more satisfactory results being obtained, even in light cases of the disease, from the use of pyrogallol. In 1 case it produced, on the fourth day, symptoms of irritation, and it was also unsatisfactory in 3 cases of favus, 1 of alopecia areata, and 1 case of syphilitic gummatous ulcer, which was subjected to the action of powdered aristol for three weeks. The drug was, however, satisfactory in the 8 cases of eczema in which it was employed. While exalting the virtues of aristol in surgical practice, considering it superior to iodoform, W. C. Wile[138, July] believes that in the specific lesion, the true Hunterian chancre, it acts injuriously.

John V. Shoemaker[121, June] states that his own experience with the drug substantially confirms that of Eichhoff and other observers from whom he quotes. He has used it with success in hyperidrosis and bromidrosis. In the first-named affection it is applied as a dusting-powder; in the last, either alone or in combination with boric acid.

Paul Joseph Rosenheim[74, Apr.] states that in his hands aristol, locally applied, has acted better than other remedies in chancroids and ulcerating syphilitic lesions. Some of the best results from the use of aristol have been obtained by the Italian physicians. G. Salsotto,[997, Oct. 5, '90; 245, June] for example, has tried it in the treatment of syphilitic ulcers of various stages. It was found of especial value in gangrenous ulcers and in ulcerating gumma of the penis and of the tibia. In the typical ulcers of syphilis it did very little good, being inferior to iodol. By dusting the powder into the preputial sac, after previous irrigation and drying, the author was able to cure two cases of balano-posthitis in two days, and four cases of the same nature in three days.

A. Breda$^{594}_{\text{Nov.,'90;}}{}^{245}_{\text{June}}$ has given the drug an extensive trial in a large variety of venereal disorders, employing the medicament either as powder, in qintment, or in collodion. It acted promptly and satisfactorily in cases of erosive balano-posthitis, of herpes, inducing cornification in dysidrosis, in intertrigo, and even in burns. It was similarly efficacious in venereal ulcers after destruction of the virulence in the infected focus. The author found aristol superior to iodoform, and, with Seguier, considers it an *épidermisateur* of the first order. Eighty cases were treated, but no local irritating properties nor any general disagreeable effects were observed. According to Segré,$^{655}_{\text{Sept.,Oct.,'90;}}{}^{245}_{\text{June}}$ aristol acted best in ulcers previously freed from the venereal virus by some caustic, and in adenitis. In balanitis, balano-posthitis, and in initial gummata the drug produced slight effect, although better results were obtained in ulcerating gummata. A history of several cases treated with aristol is given by Sormani.$^{655}_{\text{Sept.,Oct.,'90;}}{}^{245}_{\text{June}}$ One, that of an ulcerating epithelioma, began to heal on the sixth day, and by the thirty-fifth day there was complete cicatrization. Two cases of lupus of the face healed well under the influence of the drug, and the same satisfactory results were obtained in a scrofuloderma of the dorsal region of the right foot. Success was likewise rapid and complete in a case of ecthyma. The same author asserts that he has cured various cases of varicose ulcers with aristol. The drug was employed in powder, and also in a 10-per-cent. salve. Wendell C. Phillips$^{1}_{\text{May 23}}$ has found aristol a more or less useful remedy in the treatment of nose and throat diseases, especially in cases of ozæna, but believes that the drug should have a longer trial in these cases before any definite conclusions can be given. He employed, in ozæna, a solution, in liquid petroleum, in the proportion of 40 grains to the ounce (2.5 to 30 grammes). According to Burkner,$^{147}_{\text{Oct.}}$ the drug has been satisfactory in acute and subacute internal otitis, in external ear inflammations, and in ozæna. He reports for Pirn 182 cases of rhinitis ulcerosa in which good results were obtained by the local application of aristol in the form of powder or ointment. Equally gratifying success was obtained from its use in nasal ulcerations, especially of syphilitic origin. The happiest results were obtained by James J. Levick,[9 July] in a case of poisoning by *Rhus toxicodendron*, from the local application of aristol powder. The case had already reached the vesicular stage, and so prompt was the relief afforded, and so marvelous the change produced, that the author suggests the use of the drug, in the early stages of small-pox, to prevent ulceration and pitting. According to John B. Brooke,[121 Nov.] it is exceedingly useful in the treatment of obstinate bed-sores. He reports a desperate case in which a cure was effected by an ointment composed of 40 grains (2.59 grammes) of aristol to the ounce (31 grammes) of cosmolin.

Nadaud[161 Sept. 17] uses an injection of aristol dissolved in sweet almond-oil, in the treatment of tuberculosis. This treatment alone was tried in 23 patients, the good effects being noticed in from six to seven days, when there was a lessening of the cough and a suppression of the night-sweats. After twenty days, a gain in bodily weight was usually obtained. Naturally, the greatest improvement was observed in the first and second stages; when cavities exist and the expectoration is purulent, the effects were either negative or very slight. No abscesses arose from the hypodermatic use of this drug. Daniel Lewis[40 Aug.] reports success from the employment of the drug, as a local application, in cases of hyperidrosis of the palmar surfaces, erysipelas, and epithelioma. He considers it safe, agreeable, cleanly, and efficacious. The drug was used in the form of powder, by itself or in combination with iodol, in equal parts; as an ointment, in the proportion of 4 to 30 of vaselin; as a solution, in albolen or benzoinol, 4 to 30; or, in flexible collodion, 1 to 30. Two cases of ulcers of the leg were treated by J. W. Shelar,[190 Feb.] with asserted excellent results. One of the cases was a varicose ulcer, with chronic eczema, in a woman 72 years of age, and which had resisted all previous treatment. The preparation, which was locally employed, was as follows:—

℞ Aristol.,	ʒss	(1.94 grammes).
Ol. olivæ,	ʒij	(7.78 grammes).
Lanolin.,	ʒvss	(21.38 grammes).

M. Apply twice daily.

P. J. Eichhoff[176, Mar.] replies to the criticism of Brocq and himself, published by Abram Livezey,[176, May] in regard to their favorable results from the use of aristol. The drug has been employed by Pollak,[116, Dec.,'90; 90, Sept.] in all cases where antiseptic treatment was indicated, in the form of powder. He reports favorably on 22 cases of superficial wounds, believing that aristol not only leads to an aseptic course, but also changes septic into aseptic processes. He has seen the drug render good service in eczema marginatum and crural ulcer, but has found it of no use in eczema scrofulosum. Stern[54, No.19; 28, Nov.] found its effects on bacteria to be negative. In soft sores and gonorrhœa the drug was unreliable, and it was likewise useless in lupus. Aristol did good as an aid, after the healing was started by means of scraping, and the same favorable results were noticed in other ulcerative processes. It produced good effects in 12 cases of psoriasis, but even in this it was inferior to chrysarobin. It was of no use in eczema parasitarium.

Aristolochia Mexicana.—It is asserted by R. E. C. and A. L. H.[792, Dec.,'90] that this plant, locally applied and taken internally, is an infallible remedy in the treatment of the bites of poisonous insects and reptiles. They also recommend it, according to report of F. Semeleder, corresponding editor, Mexico, as diuretic, sudorific, and without rival in diseases of the mucous membrane of the bladder. They have seen it do good in chlorosis, intermittent fevers, asthma, and dyspepsia. In Mexico, aristolochia is used by the laity as an abortifacient, and also in cases of suppressed lochial discharges, with asserted excellent results. The powder is given in 1-drachm (3.89 grammes) doses, and the tincture in from 30 to 40 drops (1.87 to 2.50 grammes). The drug is used in chronic diarrhœas, and is said likewise to possess excellent antisyphilitic properties.

Arsenic.—An exceedingly interesting case of brown discoloration of the skin, produced by long use of arsenic, is published by Foerster.[4, Dec.8,'90] A boy, 10 years of age, suffering from persistent fever, followed by exophthalmos and thyroid pulsation, took, in the course of two months, 30 grammes (1 ounce) of the liquor potassii arsenitis of the German Pharmacopœia. He was discharged improved, but in fifteen days returned, exhibiting a yellowish discoloration of the skin, face, and trunk, which gradually deepened into brown. Twenty-five grammes (6¾ drachms) more of the same solution were prescribed, but the fever got worse, and the drug was discontinued. Subsequently, the arsenical preparation was again administered, in 5-minim (0.30 gramme) doses, once or twice daily, for a period of three and a half months. The patient left the hospital convalescent, and about two years later was reported as only slightly affected by his old disease, but a light-brown coloration still remained over the chest and abdomen.

Paul Muller[6, July 4] cannot sufficiently recommend the internal use of arsenic for the removal of warts on the hands. The commencing dose for children is ¼ drop (0.016 gramme) three times a day, the quantity being gradually increased. The warts are said to disappear in three weeks after the commencement of the treatment. J. Simon[100, Feb. 19] uses arsenic extensively in the treatment of diseases of children, rarely prescribing it, however, before the child is 2 years of age. His preference is for a solution containing 0.001 gramme ($\frac{1}{64}$ grain) of the arseniate of soda to a teaspoonful of water. The commencing dose is 0.0005 gramme ($\frac{1}{130}$ grain) up to 0.002 gramme ($\frac{1}{32}$ grain) at each meal, the medicament being stopped at least eight days a month. John Aulde,[1, Apr. 4] in an exhaustive article on the pharmacology and therapeutics of arsenic, recommends the following in the vomiting of pregnancy:—

℞ Acidi arseniosi,
Ext. ignatiæ, ... āā gr. ss (0.032 gramme).
Pulv. ipecac.,
Ext. cascaræ sagradæ, ... āā gr. xv (0.970 gramme).
Ol. gaultheriæ, ... gtt. ij (0.097 gramme).
M. et ft. pil. no. xx.

Sig.: One pill after meals, the patient being advised to take dry diet, with liquids principally between meals.

Aulde considers that the hypodermatic use of arsenic has not received the attention from physicians which it should.

Cutherston[139 Mar.; 112 May] reports 5 cases of marked diabetes in which Fowler's solution, combined with the tincture of calumbo, gave good results. In 1 case codeia was employed, in addition to the above mixture. Four out of 5 cases were in women. Cutherston believes that the arsenic increases the activity of the blood-corpuscles, thus enabling the hæmoglobin to resist the toxic effect of the sugar. F. Augustus Cox[26 Feb.] considers arsenic to act best when given in solution. Judging from the sales of an old-established wholesale drug-house, it would seem that twelve times more Fowler's solution was used in 1890 than liquor arsenisi hydrochloricus. The writer personally prefers the latter preparation, as being an acid solution, less likely to produce gastric derangement, and compatible with acids and the perchloride of iron. The average dose employed was 4 minims (0.24 gramme) of the B. P. solution, thrice daily, in water, after meals. In 1700 cases in which this solution was employed in the treatment of skin diseases, there were disagreeable effects only in about 7 per cent. The untoward effects of arsenic are ranged in three divisons,—gastro-intestinal, nervous, and ophthalmic. These may often be obviated by the addition of 5 or 6 minims (0.30 to 0.36 gramme) of the tincture of iron. Urethral hæmorrhage and hæmorrhage from the bowel, in a patient convalescing from typhoid fever and diarrhœa, with dysuria, were the most unusual ill effects noticed from the use of this drug. In order to prevent a fungoid growth, which makes its appearance in the liquor arsenisi hydrochloricus, it is recommended that one-eighth of its bulk of the tincture of the perchloride of iron be added.

From a study of the above cases, Cox[26, Apr.] has observed, as a result of arsenical medication, marked swelling of the eyelids in only 3 cases of the series. In 2 of them especially (both females) the symptom was well marked, but the swelling, which only appeared below one eye, was probably not due to the drug, as the case was associated with an attack of biliousness. The same symptom was afterward noticed in another patient not included in the series. The author has seen a slight palpebral swelling occurring in some cases of conjunctivitis, but not to any marked extent.

Harold N. Moyer[80, Jan.] recommends the hypodermatic use of arsenic in the form of 1 part of anhydrous sodium arseniate to 100 parts of water, the dose to be about twice that of Fowler's solution. John Aulde[663, Dec.,'90] again presents his favorable opinion of the value of arsenite of copper in indigestion. W. H. Bentley[80, Jan.15] thinks that it offers a hope even in inveterate cases of chronic diarrhœa. Z. P. Landrum[176, Nov.] criticises W. R. D. Blackwood, who has made the statement that arsenite of copper is a delusion as a remedy for diarrhœa. Landrum believes that it is an excellent remedy in this disease. Aug. Korndoerfer[19, July 26] calls attention to the fact that it has been used with success in the treatment of diarrhœa since 1865. He gives the names of several observers who have employed the drug, and always with satisfactory results, in the treatment of the disease mentioned. H. G. Norton,$^{1}_{\text{Oct.10}}$ in summarizing a large number of cases, declares that he has never observed any good results following its employment in diarrhœa. While William J. Burd$^{1}_{\text{Nov.7}}$ extols its good effects in acute diarrhœal diseases, Charles G. Kerley and E. B. Doolittle$^{1}_{\text{Nov.7}}$ condemn the remedy as useless. Numerous cases are cited *pro* and *con* to prove their assertions. John B. Carrell$^{176}_{\text{Mar.}}$ believes that infinitesimal doses of tincture of kino, with regulation of the patient's diet and habits, would give as brilliant results as are obtained by Aulde from the arsenite of copper.

B. K. Rachford$^{426}_{\text{Oct.}}$ has obtained marked benefit from its use in the treatment of diseases especially affecting the mucous membrane of the intestinal tract, such as typhoid fever, chronic catarrh of the intestines, summer complaint, and tubercular diarrhœa. He believes that the salt has even, outside of this field, a much wider application. John Aulde,$^{19}_{\text{Aug.22}}$ in writing upon the subject, makes no claim to priority in the use of arsenite of copper. J. Lindsay Porteous$^{36}_{\text{Dec.,'90}}$ claims to have been successful in the treatment of cholera infantum, diarrhœa, and dysentery, by means of this drug. He dissolves $\frac{1}{100}$ grain (0.00065 gramme) in from 4 to 6 ounces (120 to 180 grammes) of water, of which a teaspoonful is given every ten minutes during the first hour, and then the same quantity every hour, as required. The author asserts that the remedy, used in this way, also gave relief in cases in which vomiting existed as a complication of the disorders mentioned. W. Blair Stewart$^{1}_{\text{Oct.24}}$ confirms its good effects in diarrhœa, and says that it is valuable for its antispasmodic, astringent, and, probably, antiseptic action. The remedy should be given in water previously boiled, and should be followed, after elimination has been accomplished, by a simple laxative or cathartic, by the administration of a combination of ipecac and calomel, $\frac{1}{100}$ grain (0.00065 gramme) each every two hours. He asserts that, after the copper. this combination gives most excellent results in both children and adults. The uses of the copper salt are likewise upheld by H. B. Rue,$^{1}_{\text{Oct.24}}$ who believes it to be a powerful germ-destroyer, but should not be given in *all* cases of diarrhœa, the best results being observed in acute cases. S. B. Overlock $^{1}_{\text{Oct. 24}}$ also affirms that the drug does most good in acute forms of diarrhœa, and especially at the beginning of the disease, no success being obtained in a case that has been in progress for twelve hours. The same author has found the remedy efficacious in the night-sweats of phthisis. Another observer in favor of the arsenite of copper, in the treatment of summer complaint of children, is W. J. Owsley, $^{1}_{\text{Oct. 24}}$ who says that the good effects of the remedy in that disorder is simply phenomenal. He believes it to be one of the best remedies, especially in infantile diarrhœas and in dysentery. After administering calomel in minute doses, he orders a solution of 6 to 8 tablets of $\frac{1}{100}$ grain (0.00065 gramme) each, in half a glassful of water, and of this mixture he gives a teaspoonful every fifteen minutes until 6 or 7 doses are taken, when a teaspoonful is ordered after each operation of the bowels.

Asparagus. — Samuel Wilks $^{6}_{\text{June 6}}$ asks the question whether asparagus has a stimulating or inhibiting action on the kidney. The writer is acquainted with cases where the urine has been diminished to one-half its usual quantity and micturition lessened in proportional frequency from the use of asparagus. "M. B., Cantab," $^{6}_{\text{June 13}}$ writes that, having indulged rather heartily in asparagus, there was an increased frequency of desire for urination, though the actual amount of excretion was considerably diminished. There were also deep-cutting pains in the perineum and in the glans penis. C. Meymott Tidy $^{6}_{\text{June 13}}$ finds an inhibiting action to occur in at least 5 cases out of 6. "F. R. C. S." $^{6}_{\text{June 13}}$ thinks that the conclusion has been reached that asparagus is a diuretic from the characteristic odor which it conveys to the urine, and that the urine will be reduced quite one-third of the average, by two meals of asparagus in a day. Frederic Vicars $^{6}_{\text{June 13}}$ has always heard asparagus spoken of as a diuretic. In Poland, where his observations were made, a person would, perhaps, eat a bundle of sixty pieces at a meal, while here about ten or twelve pieces of a corresponding size might be put down as the average. Marcelli Nencki $^{520}_{\text{No. 3;}}\,^{26}_{\text{Mar.}}$ states, from his experiments, that the peculiar odor which is noted in the urine of those having eaten asparagus is due to the development of methylmercaptan. This compound is gaseous, having a formula CH_3SH, and is produced by the decomposition of proteids under the influence of microbes. This substance was obtained from those who had eaten largely of asparagus, by a method described in the author's original paper.

Aspidium Filix-Mas.—A case of male-fern poisoning is reported by Schlier.$^{84}_{\text{No.22,'90;}}{}^{90}_{\text{Sept.}}$ The patient took about 2 drachms (7.78 grammes) of the extract with nearly the same quantity of the powder, followed by a tablespoonful of castor-oil an hour afterward. The worm was expelled, but nine hours later symptoms of poisoning appeared, which lasted for two days, consisting of headache, pain in the region of the liver, high fever, small and frequent pulse, hiccough, and a feeling of strangulation. Albumen appeared in the urine, and the pupils were insensible to light. The author advises the use of purgatives in these cases, in order to get rid of the drug as soon as possible.

Astringents.—On the theory that substances, as astringents, which cause general constriction of the blood-vessels, do not change the amount of the fluid going into them, M. A. Walker$^{99}_{\text{May 21}}$ condemns the use of such drugs in endeavoring to control hæmorrhages. The author, therefore, disapproves of the administration of astringents in the treatment of hæmoptysis, erysipelas, or any other condition where it is desired to cause a diminution of the supply of blood to the part. Writing upon the subject of the general action of astringents, Samuel Wolfe$^{760}_{\text{July 18}}$ arrives at the following conclusions: 1. Astringents increase the coagulability of the blood in the wound. 2. They increase the consistency of the whole mass, and thus favor diminution of pressure in the small arteries. 3. They increase the contractile power of the vessel at the point of rupture. 4. They diminish the expansibility of the entire arterial system and of the heart, and hence their capacity and the volume of blood moving through them.

Atropamine.—See Belladonna.

Atropine.—See Belladonna.

Balsam of Peru.—Following the practice of Annibale de Giacomo, who appears to have used, with much success, the balsam of Peru in the treatment of tubercular lesions, de Amicis$^{505}_{\text{Sup.,Sept.,'90;}}{}^{245}_{\text{June}}$ employed the same remedy in ulcerating venereo-syphilitic and lupous processes; and, from the results obtained, publishes the following conclusions:—

1. Balsam of Peru favors decidedly the process of reparation in ulcerating syphilitic lesions, but does not seem to have a notable

action on lupous processes; more observations, however, are necessary in order to settle this latter point.

2. It does not modify the stage of ulceration of the simple contagious ulcer, yet it acts well upon the process of repair after destruction of its virulence by a caustic.

Belladonna.—N. Ostermayer[295, V.47, No.3,4] has written an interesting work upon the sedative and hypnotic action of atropine and duboisine. This author has given atropine to insane people in single doses of 0.001 to 0.002 gramme ($\frac{1}{64}$ to $\frac{1}{32}$ grain) hypodermatically. He found the action to be sedative, thus indirectly possessing an hypnotic effect. In his experience, this drug is next to hyoscine in the sureness and safety of its action, and does not possess some of the disadvantages which are seen when hyoscine is used. In forty-five observations, only two injections produced unpleasant symptoms, consisting in diarrhœa and vomiting. Benefit was often derived where hyoscine and morphine had previously failed. The sulphate of duboisine was found in no way to be inferior to the action of hyoscine. In cases of intense excitement, Ostermayer gave injections of 0.002 to 0.003 gramme ($\frac{1}{32}$ to $\frac{1}{22}$ grain); in milder cases, 1 to ½ milligramme ($\frac{1}{64}$ to $\frac{1}{130}$ grain). It seems as though some persons are more susceptible to this drug than others, 0.0005 to 0.001 gramme ($\frac{1}{130}$ to $\frac{1}{64}$ grain) accomplishing the same results as 0.003 gramme ($\frac{1}{22}$ grain) in other persons. No unpleasant after-effects were noted, neither did the continued use of the drug show any lessening in the good effects. Ch. Liégeois[184, Nov.15,'90] has obtained the best results from the use of belladonna, or its active principle, in the treatment of migraines due to a vaso-dilated condition of the parts affected. In doses of from 0.01 to 0.03 gramme ($\frac{2}{13}$ to $\frac{1}{2}$ grain) of the extract, belladonna is the best remedy to use, according to the author, in chronic urticaria, a disease which appears to be due to an acute œdema of the connective tissue of the skin, as the result of an active vasomotor dilatation. The same writer reports for Mussy the good results obtained in the treatment of the paroxysm of angina pectoris, from the following solution, hypodermatically administered, in 5-drop (0.30 gramme) doses:—

℞ Hydrochlorate of morphine, .	0.50 gramme	(8 grains).
Neutral sulphate of atropine, .	0.01 gramme	($\frac{2}{15}$ grain).
Distilled water, . . .	10.00 grammes	(2½ drachms).

In the treatment of urethral spasm, Q. C. Smith[86, Dec.,'90] has employed the sulphate of atropine in $\frac{1}{25}$ grain (0.0026 gramme) doses, with excellent results. In cases of marked physiological effects, and even in threatened poisoning by the mydriatic, jaborandi has usually counteracted, in a successful manner, the action of its antagonist. A. F. Watkins[199, July] reports a case of opium poisoning, in which the patient was saved by the administration of belladonna, given by the mouth and hypodermatically. Another case is mentioned, in which the ingestion of the mydriatic was refused and the patient died. Four exceptional cases of disturbed respiration, due to various causes, 2 occurring in adults and 2 in babes, are reported by George B. Taylor,[112, Nov.] in both of which the use of belladonna was efficacious. The author believes that in both cases the alkaloid exerted an action on the respiratory and secretory nerve-centres and their efferent trunks.

E. Benkendorf[129, Dec.,'90] describes the benefits to be derived from the dosimetric system of giving atropine in the various affections of the urinary tract. From sixty-five cases of various forms of heart disease, in which Cardarelli[229, June] employed atropine for experimental purposes, the author formulates the following conclusions: (1) atropine in $\frac{1}{120}$ to $\frac{1}{32}$ grain (0.0005 to 0.002 gramme) doses, hypodermatically administered to man, manifests itself first in its action on the heart; (2) the action of atropine on the heart consists in overcoming, to a greater or less degree, the inhibitory influence of the vagus nerve; (3) as a consequence of this paralyzing action on the vagus, there is constant acceleration of the cardiac rhythm, which may be in certain cases accompanied by a slight transitory slackening; (4) arterial pressure is reduced under the influence of atropine in direct proportion to the acceleration of the rhythm. Cardarelli, therefore, recommends the use of the drug in cases of slow pulse accompanied by vertigo or syncope, while he believes it is contra-indicated in slight forms of irritation of the vagi with no slackening of the pulse. Leszynsky[112, May] has used the hypodermatic method of administering atropine in the treatment of two cases of localized muscular spasm, one being cured and the other receiving marked benefit. Two cases of atropine poisoning are reported by Owens.[6, v.2,No.9] In the first instance 2 to 3 drops of a solution of 2 grains (0.12 gramme) of atropine to the ounce (30 grammes) of water were instilled into the eyes of a boy, on eight different occasions in the course of three days, and were followed by all the characteristic symptoms of atropine poisoning, with the exception of the rash. The second case was that of a healthy old man. Of the same solution 2 or 3 drops were instilled into the eyes three times in about twenty minutes. This short application was likewise followed by symptoms of poisoning, characterized by complete paralysis and almost entire loss of consciousness. The body soon became covered with an erythematous rash and the pulse could scarcely be counted. Both cases finally recovered.

Benzin.—F. W. Langdon,[58, Feb. 7] has employed this substance with success in skin diseases of mycotic origin, especially in the ordinary furuncle. The author also regards it as an excellent parasiticide, recommending it especially on account of its cheapness.

Benzo-phenoneide.—This is a new microbicide, discovered by Galezowski and Petit.[6, Jan. 10] It is prepared by decomposing an aniline dye, and is the tetramethylo-diapsido-benzo-phenoneide. In a recent note, presented to the Société de Biologie, the first-named author spoke of the microbicidal properties of the new drug, as being as powerful as those of pyoktanin. Locally applied, it proved very efficacious in the rapid and painless cicatrization of obstinate corneal ulcers. It also gave good results in purulent keratitis and in chronic phlyctenular ophthalmia.

Betol.—The name of betol is given to the salicylate of naphthol, which is recommended as an intestinal antiseptic in diseases of childhood. Yvon[51, Apr.] recommends the following formula, the whole of which can be given in twenty-four hours, in dessert-spoonful doses:—

℞ Gum-water, ...	20 grammes (5¼ drachms).
Syrup of orange-flower, . . .	30 grammes (1 ounce).
Betol, ...	1 gramme (15½ grains).

The drug can also be used in 4-grain (0.26 gramme) doses, dissolved in milk.

Bismuth.—The name of dermatol has been given by Heintz and Liebreich,[55, June 30; 80, Aug.] to the gallate of bismuth. From the results obtained in more than 100 cases treated with the drug, the authors consider it an excellent cicatrizant. They have employed it with success in the treatment of burns, eczema, ulcers, and affections of the eye, nose, and ear,—especially in otorrhœa. It can be given also internally, in doses of 30 grains (1.94 grammes) without producing poisonous effects. In this way it may be administered as a substitute to the subnitrate of bismuth. E. Glaeser,[317, Oct.] while admitting the great value of dermatol in gynæcological practice, does not consider that it can ever replace the more important iodoform. The chief use of the latter is in wounds discharging much odorous pus, while the best effects with dermatol are to be obtained in aseptic granulating wounds not involving too much surface. Iodoform brings on secretion, while dermatol hinders its formation. C. A. Powers[1, Nov. 7] states that dermatol is a subgallate of bismuth, and that it is without odor, non-irritant, and non-poisonous. Fischer[510, Aug.] writes that it can be prepared in the following manner: Fifteen parts of bismuth subnitrate are dissolved in 30 parts of glacial acetic acid, 200 to 250 parts of water are added, and the mixture filtered. To this mixture is added, with constant stirring, a warm solution of 5 parts of gallic acid in 200 to 250 parts of water. An insoluble precipitate is formed, which is first to be washed by decantation, and then on a filter, until the washings give no traces of nitric acid. This is then to be dried at 100° C. (212° F.). The powder thus prepared should be insoluble in alcohol, showing the absence of gallic acid, and should show the presence of not less than 55 per cent. of bismuth oxide, the theoretical amount contained in the compound being 56.66 per cent. P. Grossman[106, Oct.] uses dermatol mixed with an equal quantity of castor-oil in the treatment of sore nipples. As the drug is not toxic, it is not necessary that the breast be thoroughly cleansed before the child receives its nourishment. Rosenthal[4, Nov. 21] believes, from his bacteriological experiments, that dermatol is not an antiseptic in the true sense of the word. He has found the following formulæ of use in the various forms of skin disease:—

℞ Dermatol,	10 parts.
Lanolin,	20 "
Vaselin,	70 "

M. Sig.: Salve.

℞ Dermatol,	2 parts.
Oxide of zinc,	2 "
Vaselin,	20 "

M. Sig.: Salve.

℞ Dermatol,	2 parts.
Oxide of zinc,	24 "
Starch,	24 "
Vaselin,	50 "

M. Sig.: Of use in eczema.

℞ Dermatol,	5 parts.
Oxide of zinc,	5 "
Gelatin,	30 "
Glycerin,	30 "
Water,	30 "

M. Sig.: Modification of Unna's ointment, in which 5 grains (0.32 gramme) of the oxide of zinc are replaced by the same amount of dermatol.

Bleeding.—See Venesection.

Boracic Acid.—The results of a long series of experiments upon the lower animals, by Gaucher,[2013 Oct.,'90] are very interesting and extremely important. They show that boracic acid is capable of counteracting and even destroying tubercular disease. In these trials, lung-decay has been arrested and improvement in every way effected under the action of boracic acid, but whether the procedure would give the same results in human tuberculosis remains to be seen and studied. Jaenicke[116 No.8; 26 Nov.] believes that boric acid is useful in the treatment of wounds, but that in order to affect the germs it must be applied in strong solutions. For this purpose, therefore, it should be applied in gauze soaked with from 4- to 7-per-cent. solution, and covered with gutta-percha to prevent drying. It may also be employed in substance. The drug penetrates necrotic tissues and renders wounds unfit for the thriving of bacteria; it is unirritating and non-poisonous, and under the use of moist dressings inflammation and suppuration are prevented. The author calls attention to a new derivative of the acid, made by a combination, at a boiling temperature, of boracic acid and borax. This new compound has been employed with great success by the author, in 16- and 30-per-cent. solutions. He considers it superior to boracic acid itself. From an extensive use of the drug in China, H. M. McCandliss[235 Dec.,'90] has found boracic acid to be an excellent antiseptic remedy, locally applied in the form of powder, in the treatment of common ulcers of the leg and even leprous ulcers. It also corrected, used in this manner, the foul condition of the ulcers, and thus lessened the irritability and even feverish state of the patients.

Borax.—In order to avoid gastric and skin troubles in the treatment of epilepsy by means of borax, it is recommended by Charles Féré[3 Feb.4] that large doses of an antiseptic, such as naphthol and salicylate of bismuth, be employed.

Bromides.—It has been demonstrated by Charles Féré[452 Dec.,'90] that naphthol and salicylate of bismuth have the power of preventing certain deleterious effects produced by the prolonged administration of the bromides,—such, for instance, as ulcerations. It is asserted by the same author that patients under the action of naphthol can take as high as 16 and even 17 grammes ($4\frac{2}{15}$ to $4\frac{1}{3}$ drachms) of the bromides without exhibiting bromism. Féré claims that the cutaneous eruptions, which appear to be connected with gastric troubles, are also prevented by the simultaneous use of naphthol. Twenty well-recorded observations are published by the author, who, in conclusion, affirms that the bromides are efficacious only in large quantities, and that, in order to prevent the effects of these, naphthol in 4-gramme (1 drachm) and salicylate of bismuth in 2-gramme (31 grains) doses are the best agents to be employed in the prevention of bromism. George J. Monroe[139, May] reports his own case and that of a man in whom the administration of bromide of sodium was followed by nocturnal erections and seminal emissions. The same drug produced orgasms in a girl; and in a boy suffering from seminal emissions as the result of masturbation the trouble was increased. These same effects have been noticed by the writer in 2 other cases, which were distinctly traceable to the action of the bromides. Cohn[41, Feb.12] has investigated the changes which occur when ethyl bromide is introduced into the system. This drug has been much used in the last two years in the practice of dentistry, and in 1 case death has been produced by its use. When taken, there is soon observed a peculiar garlicky odor of the breath, which the writer considers to be due to the transformation of the ethyl bromide by means of sulphuretted hydrogen into a sulphide of ethyl. This change probably produces deleterious results. It is suggested that experiments be made with the sulphide of ethyl upon the lower animals, in order to prove or disprove this theory.

Jul. Donath[116, June] has used ethyl bromate in 10 cases of genuine epilepsy. The drug was given in an emulsion, in an alkaline solution, or in gelatin capsules. The frequency of the attacks was diminished by its use. A case of fatal poisoning by bromide of ethylene, administered by mistake, is reported.[6, Jan.10] No anæsthesia was produced, and the patient died next day from uncontrollable vomiting and suppression of urine. Post-mortem examination showed an empty bladder and hyperæmia of the cerebral meninges of the lungs, of the spleen, and of the kidneys. The hepatic cells exhibited a granular degeneration, and the viscera had a strong, garlicky odor. Attention is called[38 M.Q.] to the dangers associated with the compounds of ethyl and methyl bromides—especially the latter. When inhaled, they are apt to produce spasmodic contraction of both the pulmonary and coronary arteries, owing to the liberation of bromine, and may thus cause death by syncope. Methyl bromide is an unstable compound, being insoluble, and, if fresh, an irritant.

Bromoform.—S. Solis-Cohen,[109 Aug.] who has used the drug locally, says that it is effective not only as an antiseptic, but that it also controls morbid secretion. He has employed it successfully in tuberculous and other ulcers of the throat, in which it also seemed to act as an analgesic. The author affirms that it has likewise done good service when combined with iodoform. Chas. W. Earle[61 Sept.26] reports 5 cases of whooping-cough where the drug produced marked improvement. The dose for a child 2 years of age is 2 drops (0.13 gramme), best given after meals. From 20 to 60 drops (1.25 to 3.75 grammes) in five or six days lessened the number of paroxysms. The author recommends that the medicine be given in syrup of acacia, and that it be combined with paregoric. C. Binz[273 B.28,H.3,4] affirms that after repeated inhalation, or after hypodermatic injections of bromoform, bromine, in the form of a salt of hydrobromic acid, can be clearly detected in the urine, if sufficient time is given for absorption to take place. A case of bromoform poisoning is reported by E. Sachs,[116 Dec.,'90] occurring in a child 4 years of age, after a dose of 1½ grammes (23 grains). The symptoms were those of collapse, great weakness, cyanosis, dilated and fixed pupils, and coldness of extremities. The patient recovered under the hypodermatic use of ether and tepid baths.

Bromol.—This substance is the tribromophenol, and is obtained by adding bromine water to an aqueous solution of carbolic acid. It is almost insoluble in water, but readily so in alcohol, ether, chloroform, glycerin, and in fatty and ethereal oils; its odor is disagreeable, but its taste is sweet and astringent. According to Rademaker,[6 Oct.10] the drug has given good results in diphtheria, in which he has used it, in a glycerin solution of the strength of 1 in 25, locally applied. He has also used it in cholera infantum, in doses of from 0.005 to 0.015 gramme ($\frac{1}{12}$ to $\frac{4}{17}$

grain). The drug is said to be secreted by the kidneys in the form of tribromophenol-sulphuric acid.

Bryonia Alba.—Mankowsky[276, May 20] states that from bryonia alba we are able to isolate two amorphous alkaloids,—bryonine and bryonidine,—both of an extremely bitter taste. On account of the irritating action which bryonidine exercises upon the gastro-intestinal mucous membrane, this drug should not be used for therapeutic purposes, but should give place to bryonine. Bryonia has been employed of late by Huchard[58, Sept. 19] in the treatment of whooping-cough, especially in combination with drosera. The powder of bryonia, according to the author, may be given in doses of from ½ to 4 grammes (7¾ grains to 1 drachm) a day.

Bull-Nettle.—See Jatrophia Stimulosus.

Cactus Grandiflorus.—The physiological action and the therapeutic applications of this new drug are carefully reviewed by P. Watson Williams.[15, Oct.] The author has seen it do good in many cases of heart disease, having an experience with the drug in nearly 200 cases of this nature; but believes that it is inferior to digitalis in mitral regurgitation and in dilated, thin-walled hearts. He mentions a case of dilatation with relative incompetence of the mitral valve, in a man 72 years of age, in which the administration of the tincture of cactus, in as high a dose as 20 minims (1.25 grammes) every 4 hours, brought complete relief, whereas digitalis had failed. While it is a safe drug and does not possess cumulative effects, nor cause gastric disturbance, the author believes that it cannot very well replace digitalis. It was found useless in mitral regurgitation with obstruction, and even in simple mitral obstruction, though it gives relief, it is contra-indicated, owing to its power of shortening the diastole. The usual dose was from 15 to 20 minims (0.90 to 1.25 grammes) of the tincture three times a day; of the fluid extract, about half this amount. From a clinical study of the drug, Boy-Teissier and Boinet[67, Oct. 30] find that it can be administered, in certain cardiac affections, in large and repeated doses with good effect. They have employed it in myocarditis, valvular lesions, and other cardiac troubles, in doses as high as 80, 100, and even 120 drops of the tincture a day, for several weeks, without producing evil effects. The drug has no cumulative action, and may be considered especially as a cardiac stimulant, increasing the energy of an enfeebled organ.

Caffeine.—A careful study of this drug, especially in regard to the literature of the subject, has been made by Schivardi.$^{505}_{\text{Nos. 101 to 104;}}$ $^{25}_{\text{Feb.}}$ The work of Sée, Semmola and Marconi, Fraenkel, Schroeder, Stahl, Eloy, Huchard, Gempt, Bach and Strauch, Schultze, and others has been reviewed. The drug, from its well-known physiological action upon the cardiac muscular fibres, has been found of service in vascular affections, especially in those cases where there are no pathological conditions of the arteries, as in that disorder described by Semmola as "paralytic ataxia of the heart." The diuretic properties of the drug are marked, and thus has produced good results in the treatment of chronic pleurisy. Instances are also cited in which the alkaloid has been effective in the treatment of fibrinous pneumonia. A remarkable case of strangulated inguinal hernia is referred to, occurring in a woman 40 years of age, where the drug, combined with benzoate of sodium, promptly relieved the condition and prevented a fatal issue. The author recommends the following mixture, first used by Huchard, to be administered hypodermatically, preferring to give it in this manner than by the mouth:—

℞ Caffeine, ...	2.56 grammes (39½ grains).
Benzoate of sodium, . . .	2.95 grammes (45½ grains).
Distilled water, ...	6.00 grammes (1½ drachms).

Of this mixture 10 c.cm. (2½ drachms) are to be administered at each injection.

G. Sée$^{81}_{\text{July 2;}}$ $^{673}_{\text{Aug.}}$ says that the chief use of caffeine as a diuretic is in cases of dropsy of cardiac origin. It is also a general excitant, but has no special action directly upon the heart.

Camphor.—Camphorated oil has been found of service, hypodermatically injected, by Alexander,$^{24}_{\text{Sept. 13}}$ in a variety of diseases, such as follicular angina, coryza, and pharyngo-laryngitis; in catarrhal bronchitis, in fibrinous pneumonia, in chlorosis, anæmia, and even in the third stage of pulmonary consumption. The expectoration was diminished and even arrested, the night-sweats and fever much reduced, the appetite and the strength of the patients being increased under the action of the remedy. The injection of the drug diminished the attacks of hæmoptysis, and even prevented their return. The oil, however, was apt to produce certain untoward symptoms, such as headache and disturbed sleep, after eight or ten days of its use. The dose for each injection is put down at about 15 minims (0.97 gramme).

A case of erysipelas is reported by M. B. Cochran[80, Feb.] as being rapidly cured by the local application of carbolate of camphor. Cochran has employed this drug with success, externally, in cases of vaginitis, vulvitis, and pruritus vulvæ, and internally in cases of gastric and intestinal catarrh. The carbolate of camphor readily dissolves menthol, cocaine, salicylic acid, iodoform, chloral, and mercuric chloride. It can be given in capsules, in doses of from 5 to 10 drops.

Camphor Monobromide.—There is no better remedy, according to W. F. Curryer,[192, July] for the successful treatment of infantile diarrhœa, and for that of neuralgias and convulsions induced by dentition, than the monobromated camphor. The author prescribes it in doses of 2 to 3 grains (0.13 to 0.19 gramme) every two hours, according to indications. The results have always been satisfactory. C. C. Vanderbeck[77, June] asserts that he has achieved marked success in relieving chordee by a suppository of monobromide of camphor.

Camphoric Acid.—Combemale[67, Jan.15] has employed the dextrorotatory camphoric acid in clinical medicine. The drug was administered in single daily doses of ½ drachm (1.94 grammes) in an alcoholic mixture. Seven phthisical patients were treated, and from the results obtained the author draws the following conclusions: 1. Camphoric acid has a definite action on the night-sweating of phthisis; it generally arrests or diminishes the trouble, and is seldom without effect. 2. These effects are produced by single doses of ½ drachm (1.94 grammes). 3. No unpleasant effects of importance follow its use. 4. The remedy acts, in tuberculosis, surely in proportion as the pulmonary lesions are less purulent. Hartleib[319, No.5] has tried the drug in the treatment of acute and chronic catarrhs of the respiratory passages. In various forms of angina, as a gargle or locally applied in from ½- to 1-per-cent. solutions, it gave good results; but no special advantages were noticed in cases of chronic bronchitis and tuberculosis. The best results were obtained, however, in the treatment of chronic cystitis. Of the 5 cases reported, 3 were absolutely cured in from three to six weeks. In these instances the bladder was washed out twice daily with a ½-per-cent. solution. Good results were also observed in the treatment of night-sweats. No unfavorable after-effects were produced by the drug. The camphoric acid was administered in glycerin, aqueous, or alcoholic solutions. To the aqueous solution bicarbonate of sodium was added with advantage.

Cannabis Indica.—This drug is, according to J. B. Mattison,[1 Oct. 10] the best drug for the treatment of migraine, in which it not only acts as a calmative, but also as a curative agent. The writer, however, insists that it should be given in sufficiently large doses. In the case of an opium-eater, he gave as high as 10 grains (0.65 gramme) and even 12 grains (0.78 gramme) of the extract at a dose, with no other result than a drowsy feeling. The drug has been found of value by C. W. Suckling,[2 July 14] not only as a hypnotic, but also in the treatment of melancholia and mania, and especially in chorea, when arsenic has completely failed. In migraine it has rendered decided benefit in doses of ¼ grain (0.016 gramme) of the extract. Similarly, the writer has obtained good results from the medicament in cases of gastric ulcer and gastrodynia, and has seen it increase the efficacy of nitrate of silver when given in combination with this drug.

S. L. D.[6 Aug. 22] describes a curious series of symptoms produced on himself by a ½-grain (0.032 gramme) dose of the extract of Indian hemp. The symptoms were characterized by mental confusion, absolute forgetfulness of speech, thought, or act of the previous moment. The symptoms would come in paroxysms, lasting for a few moments, and then disappear suddenly. There was no unpleasant feeling in the head or any exaltation of spirits; the conversation and behavior were quite natural; the mind was kept perfectly clear, and even three weeks later he could remember all that occurred when under the influence of the drug. The effects passed off without the aid of any remedies.

Cantharides.—Wolfert,[6 July 4] publishes some interesting facts in regard to the therapeutic properties of cantharides, especially as a remedy for cancer. The author refers to a woman from whom an extensive cancer of the breast was removed, after which the patient was treated with cantharides, and was known to have been free from the malady six years later. A second case is mentioned by the same writer, in which a woman was treated with cantharides for a carcinomatous stricture of the œsophagus, and who was so improved that she could swallow food without much difficulty. Twelve years later she was doing well. and, whenever her malady grew a little worse, a recourse to the drug would be followed by the usual relief. Devoto[569, July 8] disfavors the use of cantharidin. Maragliano says that, in 4 cases of various kinds in which he employed the remedy, he had to abandon it on account of the renal complications produced by it. Similarly, Cantu discontinued the drug in 2 cases, owing to the serious general and local phenomena produced.

Cantharidin.—See Cantharides.

Capsicum.—W. S. Cline[186, Nov.] claims to have relieved a hopeless case of general dropsy by the simple administration of red-pepper tea.

Carbolic Acid.—It is held[38, 4th Q] that a carbolic colloid can be obtained by a combination of the two constituents, in the proportion of 20 grains (1.3 grammes) of the acid to the ounce (31 grammes) of the styptic colloid. This compound is said to be useful as a styptic, antiseptic, and a local anæsthetic; it is effective in opening superficial abscesses, and in many other similar minor operations. Delbet[48, Jan. to Mar.] finds that antiseptics, such as carbolic acid, in the proportion of 1 to 100, and the bichloride, in the proportion of 1 to 5000, assist the formation of the endothelial cells of the peritoneum, and that these, by the use of such antiseptics, are destroyed in a remarkably short space of time. In poisoning by the poison-vine and the poison-oak, R. L. Patterson[176, Aug.] recommends the glyco-phénique, 4 ounces (124 grammes); sodium hyposulphite, 1 ounce (31 grammes); water, 12 ounces (360 grammes); the part being kept constantly moist with compresses, carbolized zinc ointment to be applied to the denuded surface. Theodore G. Wormley has for several years recommended the students of the University of Pennsylvania to use the following prescription in rhus-toxicodendron poisoning:—

℞ Acid carbolic, ...	1 part.
Bisulphite of sodium, ...	6 parts.
Water, ...	100 parts.

To be applied frequently, by means of compresses.

A. Frankenburger[2014; 170, Oct.] warns against the prolonged application of carbolic acid, as injurious to the skin, and even to the bone, as it hinders nutrition and prevents removal of harmful substances from the parts treated. He believes that carbolic-acid water should not be used externally, except under the greatest precautions, and that druggists should be prevented from selling such preparation.

Carica Papaya—Carpaïne.—A new alkaloid—carpaïne—has been extracted from the leaves of the *Carica papaya* by Gresshoff.$^{744}_{\text{p.140,'90;}}{}^{673}_{\text{Nov.}}$ The hydrochlorate of carpaïne is perfectly soluble in water, the reaction with potassium iodide being extremely sensitive. The alkaloid is exceedingly bitter, and may be distinguished in a solution of 1 part to 100,000.

Cascara Sagrada.—A clinical study of this useful plant has been made by L. Harrison Mettler,$^{1}_{\text{Feb.21}}$ and in the 50 cases reported, comprising a variety of diseases widely different, but in which constipation was a prominent symptom, the results obtained were satisfactory. The drug was given by itself or in combination with other remedies. The usual dose employed was 10 drops of the fluid extract three times a day. The author believes, from such study, that cascara sagrada has no rival among other known similar remedies, and that it is a safe and reliable tonic and laxative.

Castor-Oil.—H. Meyer$^{8}_{\text{No.23}}$ finds that pure ricinoleic acid, as well as its glyceride, the ricinoleates of calcium and barium, and ricinolaïdic acid are the principles which give castor-oil its purgative properties.

Celastrus Edulis—Celastrine.—Mosso$^{996}_{\text{May}}$ has extracted an alkaloid from the *Celastrus edulis*, which he terms celastrine. He believes that it has, upon warm-blooded animals, a marked stimulating influence, and that its action is closely comparable with cocaine.

Chatinine.—See Valerian.

Chloral.—The different chloral derivatives, such as butyl-chloral, chloralamid and chloralimid, have been studied by Bardet,$^{3}_{\text{Feb.18}}$ who finds that they have a similar range of action when compared with chloral, with the advantage that they are better borne by the alimentary canal. Chloral antipyrin (hypnal) was also studied by the author, who found that in the alimentary tract it is broken up into its two constituents. He also found that the action of a single dose of chloral antipyrin is more powerful than that of double the amount of either of its constituents. According to H. F. Slifer,$^{186}_{\text{Nov.}}$ a good way of avoiding the pungent taste and burning of the tongue by chloral is to give it either in strong, hot lemonade, or in syrup of chocolate.

Chloral Antipyrin.—See Hypnal.

Chloral Carbamid—Kobert, who has experimented with this new substance, believes, according to Reuter,[953 May] that, although it possessed hypnotic properties, it is too feeble and slow to be of practical value.

Chloral Urethan.—See Uralium.

Chloralamid.—An interesting account is given by Umpfenbach[116 No.4,'90; 26 Dec.,'90] of the use of chloralamid as a hypnotic. He has tried it in 55 cases,—23 males and 32 females. Of these, 13 had hallucinations, 3 melancholia, 8 paralysis, 8 epilepsy, and 9 were imbecile. On the whole, no marked ill after-effects were produced; in 3 cases nausea was observed, vomiting in 1, while in 5 skin eruptions were caused by the drug in various parts of the body, but these eruptions soon disappeared after suspension of the remedy. The effects of the drug were good in the cases mentioned, but wholly unsatisfactory in 3 other cases,—1 of tremor essentialis, 1 of chorea hereditaria, and 1 of sclerosis disseminata.

P. Naecke[760 Oct.10] has found chloralamid a useful hypnotic in chronic mental disorders, in epilepsy and sleeplessness due to nervousness, and even as a sedative. On the whole, he considers it just as reliable and less dangerous than chloral. The doses employed by him varied from 15 to 45 grains (1 to 3 grammes).

Cash, assisted by Angus, Bullock, and Gordon,[2 July 18] has studied the action of chloralamid upon 5 cases,—2 of cardiac disease, 1 of phthisis, 1 of neuralgia, and 1 of acute melancholia. In the case of neuralgia a 30-grain (2 grammes) dose of chloralamid produced, in forty minutes, a sound and refreshing sleep, lasting eight hours. No bad after-effects were noted. Twenty-four patients suffering from all kinds of mental disease have been treated by Friis.[378 No.12; 673 June] Women were more easily influenced by the drug than men, and 2 grammes (31 grains) were sufficient to produce sleep. Chloralamid was feeble in cases of chronic alcoholism and delirium tremens; but no untoward after-effects were noticed. Emory Lanphear[143 July] favors the use of chloralamid in surgery. The remedy can be administered advantageously in alcoholic mixtures, such as whisky and cardamom tincture. Robert Main[2 May 23] affirms that he has obtained success with the use of chloralamid in cases of insomnia, and has never noticed any disagreeable after-effects. He warns, however, against its employment in kidney troubles, and reports a case of this nature in which the use of chloralamid, although producing a good hypnotic effect, was followed next day by profuse epistaxis and congestion of the face and neck. The therapeutic uses of the drug are carefully reviewed by John V. Shoemaker,[121 July] and from the evidence brought forward it is found that chloralamid has given the best results as a hypnotic. E. Mansel Sympson[15 Oct.] considers it of great value in delirium tremens, especially in the stage immediately preceding an actual outbreak. He prefers it to paraldehyd. G. Generisch,[26 Feb.1] likewise finds that the drug is an excellent hypnotic. No marked ill after-effects were observed by him. He says that, even after large doses, the symptoms which are apt to appear, such as headache, giddiness, and nausea, soon pass off. No disturbance of the digestive or urinary organs was noticed.

Chlorate of Potassium.—The internal administration of this salt is insisted upon by F. Forchheimer,[426 Jan.] notwithstanding the dangers pointed out by some observers. Two symptoms are described by the author, as being a warning for the stoppage of the drug,—drowsiness and a scantiness or suppression of urine. The dose of chlorate of potassium, therefore, should not exceed from 0.50 gramme to 2.00 grammes (7¾ to 31 grains) in from twenty-four to forty-eight hours. With this amount no serious accidents are to be feared. A fatal case of poisoning by chlorate of potassium was recently related to Thomas R. Evans[81 Apr.] by a lady. A child suffering from sore throat took at one dose an ounce (31 grammes) of this drug. The child died in about a week. He believes that many deaths attributed to diphtheria and scarlatina are due to the indiscriminate use of the potassium salt, and that the drug is contra-indicated in kidney disease. In people over 30 years of age, the potassium chlorate should not be given in over 10-grain (0.65 gramme) doses. The amount should be especially small when given in combination with the tincture of the chloride of iron, in view of the fact that this will carry the potassium salt directly to the kidneys.

G. A. Fackler[58 May 30] protests against the use of this salt. A patient, a boy 15 years of age, had taken, in the course of six hours, 150 grains (9.72 grammes) of the drug. Poisonous symptoms occurred soon afterward, and were those of cyanosis, dyspnœa, profuse alvine discharges, icterus mostly all over the body, albuminuria, and the appearance of peculiar yellowish-brown maculæ on the side of the abdomen, back, and anterior portion of the neck. The urine was of a yellowish-red color at first, changing afterward to a dark brown. The patient recovered under appropriate treatment, the principal drugs used as diuretics being acetate of potassium and the tincture of strophanthus. A case is reported[290 May], of an explosion occurring in a patient, who carried some chlorate-of-potassium tablets in the same pocket with a pen-knife. His garments were set on fire, and, before he could free himself from his clothes, he was seriously burned over an extent of more than nine inches. A case of fatal poisoning by this drug is related by Landerer[22 July], as occurring in a young man 18 years of age. The victim took, within an hour, 30 grammes (1 ounce) of the remedy in a glass of warm water. The symptoms exhibited were those arising, presumably, from an action upon the blood: acute anæmia, dyspnœa, cyanosis, and vomiting of a greenish fluid; pain in the hypochondrium, around the umbilicus, accompanied with icterus. Liver, kidney, and spleen symptoms were likewise manifested. Methæmoglobin cylinders were formed in the urine. Landerer expresses the opinion that chlorate of potassium should not be used internally, especially in children, and that even gargles of it should be limited. He believes that the best treatment in cases of poisoning by the drug would be venesection, followed by infusions of common salt, or, better still, defibrinated blood. Another instance of intoxication by this salt is spoken of by Wohlgemuth.[22 July] Similar symptoms to those in the case of Landerer were observed, but no methæmoglobin could be detected in the urine. Small, punctiform hæmorrhagic spots appeared by the sixteenth day over the legs, soon extending to the upper extremities and trunk. While not opposed to the internal use of the drug, Wohlgemuth advises that it be not administered on an empty stomach, and that the urine be examined for methæmoglobin, which should guide the amount of salt ingested.

Chloroform.—The long-mooted and still unsettled question of how chloroform kills was again recently discussed by the British Medical Association.[6 Aug.] T. Lauder Brunton still holds to the last opinion expressed by him, that the greatest danger of death from the action of the drug lies in the occurrence of asphyxia during its administration. In this connection he criticises the results of H. C. Wood, by saying that one of the tracings shown by this investigator at the Berlin Congress, in his address on anæsthetics, and which indicated the stoppage of the heart before the respiration, was an apparent and not a real stoppage, simply due to a clot in the canula, since the fall of pressure was gradual and not sudden. He does not, however, advance any proof of this statement; and it is scarcely probable that an undetected clot would thus form in the experiments of such an able investigator as H. C. Wood. Shane detailed some of the experiments performed in Cambridge University, the results of which showed that chloroform sometimes killed by respiratory failure, at others by direct cardiac paralysis. Dudley Buxton expressed the opinion that, from a clinical point of view, heart-failure was the most common form of death by chloroform, whatever may be said by others. Pridgin Teale referred to 36 cases of death from anæsthetics, reported by him two years ago, of which 33 were due to chloroform and only 3 to ether. In these 3, one occurred in chronic suppuration of the thigh, the second during an amputation of the thigh, and the third in an operation for fractured pelvis,—all more or less dangerous cases; whereas, in regard to chloroform, the 33 cases occurred during minor operations, and in individuals who were enjoying comparatively good health.

The question was also discussed from a clinical point of view by G. Earts, who thought that the deductions brought forward by the Hyderabad Commission should not be transferred absolutely to the case of human beings. Childs laid stress on the great danger attending the administration of chloroform in cases of empyema. From the fact that saline solutions, intra-venously injected, have given good results in cases of collapse in cholera and in hæmorrhage, Benjamin Ward Richardson $^{6}_{\text{Sept. 28}}$ suggests the same solution, with the addition of 5 minims (0.32 gramme) of the stronger ammonia, or 1 fluidrachm (3.75 grammes) of the aromatic spirits to 20 fluidounces (600 grammes) of the first, as a venous injection in cases of collapse from chloroform poisoning. Artificial respiration should be associated with this mode of treatment. C. Thurston Holland $^{26}_{\text{May}}$ reports an interesting case of *delirium tremens*, in which this condition was brought on by the excessive use of chloroform. The patient, a man 36 years of age, had been taking chloroform for some weeks, employing several ounces of it each day, and had been apparently under the influence of the drug until the delirium appeared. No alcohol had been used for two and a half months previously. The man finally recovered.

A case of cardiac collapse under the administration of this anæsthetic, in a woman about 40 years of age, is reported by Edward Rice,[6, Sept. 19] in which a fatal issue was undoubtedly prevented by the inhalatian of a few drops of nitrite of amyl. The author lays stress on the absolute necessity of watching the pulse, under the action of chloroform. Attention is called[175, Aug.] to the antiseptic properties of chloroform, and to its great value in diseases such as scarlatina, typhoid fever, whooping-cough, pneumonia, croup, and even pulmonary tuberculosis, as put forth by Desprez. In this latter affection, the drug, especially associated with creasote, has done good service. It is claimed that chloroform, as an antimicrobian, may be used, with most satisfactory results, externally and internally. For the obstinate vomiting often following chloroform anæsthesia, Lenevitch[530, No. 1] recommends washing of the stomach with a solution of soda of the strength of 0.5 to 1 per cent. Kirchner,[58, B.S.H. 3; 6, Dec. 20] from a series of trials, corroborates the previous statements of Salkowski, to the effect that chloroform possesses antiseptic properties. The first writer recommends chloroform-water in the treatment of wounds, as a disinfectant, and holds that it is of especial value in gynæcological and obstetrical practice. He likewise finds that chloroform-water acts favorably in intestinal troubles, particularly in the diarrhœas of children. The methods employed by Buxton and Lloyd, in the administration of chloroform, are criticised by Edward Lawrie,[6, May 18] who considers such methods as simply impracticable. Raoul Pictet,[99, Nov. 5] purifies commercial chloroform by reducing the temperature to 70 degrees, when a crystalline substance separates out. The liquid is then subjected to a temperature of 100 degrees, whereupon the chloroform separates, in the form of crystals, and may therefore be removed from the contaminating part of the liquid.

Chlorphenol.—This new medicament is said by Passerini[22, Sept. 16] to possess as high antiseptic powers as the *trichlorphenol*, with the advantage that it is odorless and non-irritating. It has been used successfully in the treatment of wounds, ulcers, and discharging glands. The author has especially employed it in tubercular cases, by means of inhalation, with marked benefit. In five cases he has observed the rapid disappearance of the bacilli soon after the inhalations of the remedy. The patients seemed to get well in the course of from two to six months' treatment. The drug gave good results, also, in laryngitis, ozæna, and bronchitis. Passerini claims, on the whole, that chlorphenol does not produce disagreeable after-effects, that it causes the disappearance of the bacilli, that it diminishes the cough and the fever, that it improves sleep and appetite, and that it causes an increase in the body-weight.

Christia.—This antiseptic tissue is prepared from a variety of Japanese paper dipped in a mixture of glycerin and gelatin.[87, June 30] The gelatin is rendered insoluble by immersion of the tissue in a solution of bichromate of potassium.

Chromic Acid.—T. Heryng[116, No. 8] continues to use the drug, not only in syphilitic affections, but in coryza hypertrophica with hæmorrhagic erosions of the septum, and also in various hyperplasias of the larynx and naso-pharynx. The results have been successful, and the author believes the remedy to be superior to trichloracetic acid, especially in that it causes less pain.

Cimicifuga.—Evan F. Smith[129, Sept.] considers cimicifuga superior to digitalis as a remedy, since it acts upon the heart similarly to the latter drug and does not produce contraction of the arterioles of the body. He has found it of great service in most cases of subacute and chronic rheumatism.

Cinchona.—See Quinine.

Cinnamon.—G. Capus[78, Dec. 13, '90] reports remarkable success attending the use of the essence of cinnamon in the treatment of those cases of malaria in which the sulphate of quinine was not successful. The oil is sprinkled several times daily upon the floor of the hospital, and has proven much more efficacious than the oil of eucalyptus, which was recently experimented with in the same manner.

Cocaine.—The local and general untoward effects of the drug, together with reports of clinical cases and the means employed to treat cocaine poisoning, with especial reference to the literature of the subject, are carefully reviewed by José Sigarroa.[773, Sept. 20] The drug has been used with success by William H. Humiston[61, July 11] in gynæcological practice. The author is in the habit of employing a 4-per-cent. solution containing 2 minims (0.13 gramme) of pure phenol in each ½-ounce (15 grammes) solution. Of this solution he injects 5 minims (0.30 gramme) into the posterior lip of the uterus.

Injections to the amount of 20 minims (1.3 grammes) are afterward made in several portions of the cervical canal, after which dilating and curetting are performed with the most satisfactory results.

M. L. Racine,[290, June 19] calls attention to the incompatibility of cocaine and bromide of sodium, which may give rise to serious danger in the administration of both medicaments conjointly. The therapeutic uses and the untoward effects of this interesting drug are carefully reviewed by G. Sée,[31, Sept. 10] who calls attention to the two agents which have been proposed to relieve the vasomotor constriction in cases of cocaine poisoning,—that is, nitrite of amyl and chloral,—both of which appear to be somewhat uncertain. Andrew Fullerton[6, Sept. 19] writes extensively on the toxic effects of cocaine, and finds that the best treatment for cocainism has been, in his hands, the administration of chloral in large doses. Opium was found to be feeble in its action, while some relief was obtained under the action of bromide of potassium by itself, or, better, in combination with the chloral. This latter alone is to be preferred. The author has also obtained good results from the use of alcohol, ether, and ammonia, especially when there is weakness of the pulse. An extensive article is published by P. Mannheim[370, V.58, No.4; 222, Sept.] on the dangers of cocaine, and, while saying that he knows of no perfect antidote, the writer refers to the uses of 1-per-cent. solutions of nitro-glycerin, of nitrite of amyl, and ammonia by inhalations as valuable antidotes in the treatment of cocaine poisoning. R. S. Hamilton[81, Oct.] considers cocaine a most excellent remedy for the treatment of spermatorrhœa, affirming that the drug is essentially an anaphrodisiac. Acconi[589, July 11] reported to the Torino Academy of Medicine that cocaine, in doses of 0.05 to 0.10 gramme ($\frac{4}{5}$ to $1\frac{1}{2}$ grains), by the mouth, increased notably the contracting power of the abdominal muscles during labor, but no changes were observed, *pro* or *con*, as regards the contractions of the uterus. H. Hallopeau[760, Aug. 1] reports an acute case of poisoning by cocaine, in which the ill effects of the drug lasted for several days, and says that cocaine, in a single dose, may give rise not only to an acute dangerous form of poisoning, but to even prolonged troubles of a painful nature. This peculiar effect of the alkaloid may be attributed to an elective action of cocaine on certain nerve-centres. A. Lutaud,[24, Jan. 18] calls attention to the reconstituent properties of this drug, and believes that its use is indicated in all cases of dyspepsia, anæmia, and the various diatheses. He thinks the medicine to be of special value to sufferers from laryngeal phthisis associated with dysphagia, as the distressing symptoms of such cases are promptly relieved by it. R. Troquart[188, Jan.4] thinks that the production of anæsthesia by the direct contact of cocaine with the mucous membrane of the urinary tract is much freer from danger than when an injection is given. If the mucous membrane is intact only a small amount is absorbed, but if it be so altered that the epithelium is removed there may be an abnormal amount of cocaine absorbed, and toxic symptoms thus be produced. Solutions (5- to 10-per-cent.) were used in the following disorders of the urethra and bladder: In simple catheterization a few drops are to be introduced by a Guyon instillateur, previous to the passage of the sound, in dilatation of both spasmodic and organic stricture, in internal urethrotomy, and in painful cystitis; here a few drops are not sufficient, and an injection of 30 grammes (1 ounce) of a 5- to 10-per-cent. solution is necessary. The therapeutic virtues of the plant *Coca erythroxylon* are upheld by P. de Pietra Santa,[1, June 27] who considers the drug to be the moderator *par excellence* of the nerves, the tonic of the muscular fibre, the strengthener of the weakened system, the unquestioned alleviator of phthisical suffering, his opinion being based upon experiments made with the preparations of Mariani, of Paris. This is sustained by a review of the therapeutic uses of cocaine.

W. Spencer Watson[22, Apr.15] believes, notwithstanding the statements to the contrary, that cocaine, applied in the form of a spray or by a brush, affords marked relief in acute tonsillitis. He recommends the addition of 1 per cent. of carbolic acid to the cocaine solution, believing that it aids very much the sedative effects of the alkaloid. E. Spencer[186, May] calls attention to the fact that cocaine and menthol are incompatible, and, although both drugs are anæsthetics in themselves, yet in combination they form a substance almost as irritating as croton-oil. Edward F. Willoughby[6, Feb.14] reports his own case and that of a lady, in which the frequent use of cocaine produced a disagreeable wakefulness. In himself the effects were successfully combated by large doses (as high as 40 grains—2.59 grammes) of chloral, the sleep thus obtained being followed by no headache or drowsiness. The author suggests that a study be made of the antagonism between cocaine and chloral. It has been observed that there is an incompatibility between the salts of cocaine and those of mercury. Schell[744, p.756] calls attention to a delicate reaction between hydrochlorate of cocaine and calomel. Breathing upon a mixture of both salts gives rise to a black coloration of the condensed moisture, and it is affirmed that no other alkaloid will behave in this manner. Again, the reaction takes place only with the salt, not with the free alkaloid. According to Brunner, the ointment of hydrochlorate of cocaine and mercuric oxide, so frequently prescribed in eye diseases, is dangerous, since with time it becomes highly irritant. J. L. Irwin[199, Ap.] does not consider cocaine an aphrodisiac. Paul Reclus[31, Jan.8] believes that poisoning by cocaine is frequently produced by large doses used to produce local anæsthesia. According to the writer, while 0.10 gramme (1½ grains) of a 10-per-cent. or even of a 5-per-cent. solution may not generally be well borne, the same amount of a 2-per-cent. solution is attended with no danger. The drug should never be thrown directly into the circulation, and a hypodermatic injection should, therefore, be given slowly, lest the needle penetrate a vessel.

Cocillana.—This drug continues to grow in favor as a remedial agent. It has given excellent results, according to John W. Eckfeldt,[121, Nov.] as a stimulant in bronchitis and pneumonia. In small doses it favors digestion and improves the appetite. The author has likewise employed it locally, with good effect, in acute coryza, and even in the chronic forms of the disease, in which cases a spray from a dilute solution of the fluid extract was used. Given internally the best preparation is the fluid extract, in doses of from 30, 40, or even 60 minims (1.87, 2.50, or 3.75 grammes), every two or four hours, according to indications.

Codeine.—See Opium.

Cola de Borrego.—This popular name is given, in Mexico, to a species of the Scrophulariaceæ family, *Castilleja canescens.* The drug increases the salivary and urinary secretion. Galindo[237, Jan.] has employed it as a stimulant in hepatic colics, in doses of 4 grammes (62 grains), in infusion, with 120 grammes (4 ounces) of water. (Report of Semeleder, corresponding editor, of Mexico.)

Combretum Raimbaultii.—An examination of this plant, which, it is claimed, is a good remedy in hæmaturic bilious fever, has been made by Heckel.[296, May 24] The principal constituents of the drug were found to be tannin and nitrate of potassium, but no active principle could be determined that would justify its asserted cholagogue properties. The natives of the western coast of Africa, among whom the remedy is known as *kinkelibah*, use it in bilious hæmaturic fevers, presumably from the fact that it acts as an active tonic and a diuretic.

Convallaria Majalis.—Manuel S. M. Bustamente[503, Oct. 4] has employed convallamarine, the active principle of *Convallaria majalis*, in a number of cases of cardiac affections, finding it of especial service in valvular lesions, with increased venous and diminished arterial tension; but the author warns against its use in opposite conditions. The dose given was 0.08 to 0.10 gramme (1¼ to 1½ grains) on the first day.

Copaiba.—The diuretic properties of this drug are extolled by Ivan N. Obelensky.[2, Sup., Aug. 8] Nine cases, comprising 4 of mitral insufficiency, 1 of aortic regurgitation, and 3 of atrophic cirrhosis, were treated with copaiba, and in all excellent results were obtained. The author believes the remedy to be superior to other well-known diuretics, especially in cases of dropsy of cardiac and hepatic origin. No marked deleterious after-effects were observed. Under the influence of the drug, the urine may be increased from 700 or 800 to 1450 or even 2000 cubic centimetres (1½ to 8 pints) in the course of twenty-four hours. The diuresis was lasting, remaining for weeks. The doses employed varied from 20 to 40 grains (1.3 to 2.6 grammes) a day, administered in the form of an emulsion. The diuretic effects are said by Obelensky to be produced by the action of the drug upon the renal secretory nerves, and not by dilatation of the blood-vessels of the kidney, as believed by Binz. Copaiba has been used with success, as a local application, in the treatment of indolent ulcers, by T. G. Stephens,[121, Oct.] who has employed an ointment composed of equal parts of copaiba and resin cerate.

Copper. — Tarnier[317, May 8; 182, Oct.] is well satisfied with the results obtained from the use of a 5-per-cent. solution of the sulphate of copper in washing out the uterus and vagina after delivery. He also finds, from control experiments with streptococci and staphylococci, that it is an antiseptic. The vibriones are, however, not influenced by its use. He concludes that in the copper sulphate there is an easily obtainable, cheap, soluble, relatively non-toxic and unusually active disinfectant. (See "Arsenic" for articles on the arsenite of copper.)

Cradine.—See Ficus Carica.

Creasote.—As this drug is being used extensively in the treatment of tuberculosis, it is of the greatest importance that a pure specimen be employed. Choay,[24 May 24; 30 July] in making a special study of the characters that creasote should possess, says that the drug should have a specific gravity of 1067, be derived entirely from wood-tar, give a green coloration with the neutral perchloride of iron, and distil at a temperature of from 200° to 210° C. The author insists that if a specimen of creasote gives a blue coloration with the neutral perchloride of iron it is *not* a good one, and probably has not been obtained from wood-tar. Similarly, if its point of distillation varies below 200° C. (392° F.), or its specific gravity goes much above 1067, the drug is not suitable for hypodermatic medication. In order to prevent the irritation of the stomach produced by creasote, Revillet[26 Aug.] suggests its administration in the form of an enema. It can be mixed with water, oil of almonds, or yelk of eggs, to form an emulsion. Excellent results are obtained in this way. Its use in the form of suppositories is recommended by Kugler.[3 Oct.21] In this manner, as much as 2 grammes (31 grains) of the remedy can be administered during the day without producing any rectal irritation, nor any other untoward effects. Valentini[296 Mar.8] finds creasote, when administered internally, to be of considerable value in the treatment of diabetes mellitus. Two cases are given in which the commencing dose of 4 drops of creasote was gradually increased to 10 drops in twenty-four hours. It is stated that the sugar gradually disappeared from the urine, and that the return to starchy food did not cause a re-appearance of the sugar. The use of the hypodermatic injections of creasoted oil has given, in the hands of Guerder,[24 May 8] excellent results in the treatment of wasting diseases. The injections were followed by local and general effects, but never of a serious nature. Absorption was more or less rapid; no abscesses were produced. The general effects were variable. Doses of 30 to 40 grammes (1 to 1¼ ounces) produced no rise of temperature. No other untoward symptoms than a slight vertigo followed the injections of the oil, while in the majority of patients there was marked improvement. Sleep was induced; the appetite increased, as did the bodily weight. The best results were observed in cases of simple continued fever and in *apyretic* phthisis, with or without abundant expectoration.

Creolin.—Edward W. Watson[80, Aug.] reports several cases of dysentery, serous diarrhœa, and summer complaint successfully treated by the use of creolin in the form of enemata, of the strength of one-half of 1 per cent. of the drug; that is, 1 drachm (3.89 grammes) to the pint (½ litre).

L. Vazei[81, Oct.] calls attention to the fact that creolin exercises a decided deodorizing power over iodoform, and that it is in itself a good disinfectant. H. Menche[158, B.12, H.1,2] has found it of great service in pædiatrics. The chief objection to its use is, that when it comes in contact with wounds containing much pus a compound seems to be formed which gives off a very disagreeable odor, so that in a close room it is unbearable.

Dermatol.—See Bismuth.

Diadermic Medication.—In an able paper, J. V. Becelaere[185, Mar.] advocates the use of diadermic medication, and points out the various advantages accruing therefrom as follows: 1. The possibility of treating certain classes of patients that would otherwise be out of reach of therapeutic help. 2. The possibility of exhibiting mathematically definite doses. 3. The absence of quantitative accumulation; the completeness of absorption. 4. The possibility, nay, the necessity of reducing doses exhibited. 5. The increased rapidity of therapeutical action. 6. The greater facility for obtaining local effects. 7. The absence of consecutive gastric irritation. 8. The absence of organoleptic impressions. 9. The absence of intermediate changes which the therapeutic agent might have undergone through the influence of digestive fluids. From a series of observations on the cutaneous absorption of substances in the form of ointments, L. Guinard[211, Sept.18,20] has arrived at these conclusions: 1. The *intact* skin does not absorb substances in the form of ointments, or, if it does, it does so very slowly and in infinitesimal proportions, and only in hairy regions. 2. The lardy excipients, vaselin and lanolin, exhibit no special differences, nor do they present any advantages in regard to the absorption of medicinal substances through the epidermis. Guinard[211, Apr.19] also states that absorption from rancid salve is better than that from the fresh article.

Digitalin.—See Digitalis.

Digitalis.—G. Sée[31, July 2] writes that digitalin is of value in increasing cardiac elasticity in diastole, and that the action of the heart is regulated without strengthening the organ. Petresco[116, Feb.] calls attention to the great efficacy of digitalis in the treatment of pneumonia. He has found that, with large doses, blood-letting and tartar emetic can be dispensed with. He has successfully employed the drug in doses of from 60 to 90 grains (3.89 to 5.83 grammes) in the course of twenty-four hours, and this for three or four days in succession. These large quantities were well borne by the stomach, and no disagreeable effects were observed. He claims to have cut short cases of croupous pneumonia in from twenty-four to forty-eight hours, having noticed an abrupt fall of temperature, together with a decline of the pulse, which is sometimes remarkable. In 1 case the cardiac rate was lowered to 24 beats per minute, the patient falling into a quiet sleep. His statistics are highly important. In 825 cases treated since 1883, he shows a mortality of only 2.06 per cent.,—certainly much lower than that presented by Benett, whose mortality was 3 per cent. for 129 cases under tonic treatment and 6.8 per cent. for 720 cases by the expectant plan, and in great contrast to the results of Edinbourg, whose mortality was 34.5 per cent. in 698 cases treated by blood-letting.

James K. Crook[82, June 20] reviews the literature of digitalis in regard to the chief therapeutic uses of the drug, and comes to the conclusion, after comparing it with other medicaments, that it will remain the most generally useful and reliable cardiac stimulant and tonic. As substitutes for the drug in question, the writer has seen fit to recommend, in the first place, caffeine, and then strophanthus and sparteine. Convallaria he considers useless. R. M. Ellyson[80, Jan. 16] records a case in which ½ ounce (15 grammes) of laudanum and 1 ounce (31 grammes) of digitalis were taken at the same time, with suicidal purposes, by a young man, without fatal results. According to C. S. Bradfute[1, Jan. 10] digitalis is contra-indicated in the second and third stages of pneumonia, and similarly in myocarditis, where the exudative material is poured out in and around the cardiac muscular fibre.

Diuretin.—Diuretin is theobrominum natriosalicylicum. F. K. Geissler[586, Nos. 46, 47, '90; 2, Sup., Aug. 1] has performed some interesting experiments with the drug upon healthy subjects and those suffering from various forms of heart disease. He finds that diuretin invariably arrests arterial tension, even to a considerable degree, that it possesses powerful diuretic properties, and is a cardiac remedy closely resembling digitalis. The best results were seen in cases of disturbed cardiac compensation accompanied by valvular lesions, in which amelioration of the usual symptoms quickly followed its use. In myocarditis the effects were less pronounced. There was no diminution in the amount of albumen in the urine of those suffering from Bright's disease, but the dropsy was removed and the quantity of solids in the urine increased. No diuretic action was observed in cirrhosis of the liver. In healthy persons the amount of urine voided was but slightly increased. The author concludes that the diuretic effect of diuretin is due not only to theobromine, but also to the salicylate of soda. Robert H. Babcock[227 Oct.] reports 2 cases which cause him to believe the drug to be a diuretic of great power and promptness, and suitable to all of the various forms of dropsy. As the arterial tension is not increased, it is likely to succeed digitalis, caffeine, and other remedies of this class, when they fail. The stomach and kidneys do not appear to be irritated from its use. The dose employed should be 90 to 120 grains (5.83 to 7.78 grammes) daily, administered in frequently repeated doses, either in warm water or gelatin-coated pills.

Edward L. Keyes[245 Nov.] considers diuretin valuable in what he calls urinary fever. Sixty grains (3.89 grammes) of salol were administered for two days previous to operation, and on the day of the operation 10 grains (0.65 gramme) of diuretin were given every four hours, and continued a day or so after the operation. This author also uses the drug in combination with morphia. P. I. Drozdovsky[2 Sep., Oct. 10] has used it in 3 cases of mitral insufficiency, in 2 of aortic insufficiency, in 1 of stenosis of the left ostium venosum, in 5 cases of chronic interstitial nephritis, and in 1 case of cirrhosis of the liver. In 8 cases the drug did not accelerate the pulse; in 4 cases the rate was slightly slowed; in 4 cases the arterial tension was lowered; in 2 others it rose 5 to 10 millimetres; in 4 cases the respiration was slightly slowed, but more frequently no effect was noticed. The diuretic effect observed was by no means constant, decrease in œdema and bodily weight occurring in but 2 cases. Dyspnœa and cough were, however, frequently relieved. The diuretin occasionally gave rise to headache, severe dizziness, giddiness, ear-noises, and nausea. The drug failed in the cases where digitalis, adonis, and strophanthus had been used and had failed. The author, therefore, reports unfavorably in regard to its use, because it has no influence on the heart, is very unreliable as a diuretic agent, and cannot be advantageously substituted for other cardiac stimulants.

Koritschoner[357, Jan. 1] has used it in 38 cases of severe dropsy, whether of renal or cardiac origin, or due to hypogastric obstruction; also in 3 cases of acute joint rheumatism. In 60 per cent. of the cases 5 grammes (1¼ drachms) were sufficient to accomplish the results; in 30 per cent., 6 grammes (1½ drachms); and in 10 per cent., 10 grammes (2½ drachms) a day were required. The medicament was used in solution prepared by the addition of warm water to the diuretin, and was given preferably several hours after meals, as the acid of the stomach hinders its absorption. Untoward effects were of minor importance, no ill effect upon the heart being ever noticed. In 23 cases the diuretic action was favorable. In 8 cases the urine increased to 10,000 to 12,000 cubic centimetres (10 to 12 quarts). In 10 cases the effect was slight, but no other diuretic gave better results. In only 1 case was there a total absence of diuretic action. The best effect is obtained in cases of cardiac dropsies, and the poorest in cases of nephritis.

Koniedj-Pomerantz[615, No. 6; 161, Sept.] considers diuretin to be even a better diuretic than caffeine. It has little or no action upon the heart-beats, and none upon the nervous system. It must be administered with caution to patients suffering from cardiac insufficiency. It may be given in milk. Siegmund Pfeffer[169, Aug.] has found it a most desirable diuretic, its chief use being in dropsies of cardiac origin. It is of less value in cirrhosis of the liver, and of no value in pleurisy and acute nephritis. Pfeffer differs from Schröder in believing it of great use in chronic nephritis. Careful and elaborate tables are added to his article, showing the pulse, respiration, temperature, and amount of urine voided in a day, under the influence of different amounts of diuretin, in persons suffering from various diseases. A. Seibert[64, Sept.] reports a case of acute nephritis in which the amount of urine under the use of diuretin was increased in two weeks from 38 ounces to 119 ounces (1200 to 3570 cubic centimetres), with a great amelioration in the symptoms. This author has used the drug in 25 cases, and finds it a powerful diuretic in cases of valvular heart-lesions, acute or chronic nephritis, but of no use in cirrhosis of the liver, fatty heart, aneurism of the aorta, and advanced chronic nephritis.

W. Schmieden [319, No. 30] has thoroughly studied the action of diuretin in 31 cases, consisting of various forms of œdema, ascites, and hydrothorax. It was found not only to be a good diuretic, but also to increase the amount of solids in the urine. It was observed, however, that the total amount of albumen was not lessened,—only that there was a lowering in the percentage as the amount of urine was increased. Schmieden noticed severe hæmaturia, and, at times, headache, irregularities of the pulse, diarrhœa, and vomiting; in this latter case the diuretin had been administered by the rectum. He recommends the drug in the majority of cases of kidney affections, acute as well as chronic, and especially in nephritis due to scarlet fever. No effect was noticed in cirrhosis of the liver or in tubercular peritonitis. Kress [34, Sept. 23] concludes, from a careful study of 20 tabulated cases, that diuretin is a true diuretic, in that it not only increases the amount of urine, but also increases the amount of the solid constituents. The diuresis is due to a direct action on the parenchyma of the kidneys, and the action upon the organs of circulation is probably secondary. Kress finds that diuretin acts best in acute and chronic heart and kidney disease. In effusions of tubercular origin no benefit is derived from its use. As high as 8 grammes (2 drachms) a day can be given without the appearance of toxic symptoms. Erb [273, B. 38, H. 1, 2] considers it a good diuretic in heart and kidney disease. The drug has no cumulative action, and is more suitable, according to his idea, in general dropsy than in local œdemas. Its dose may be put down as 5 grammes (1¼ drachms) per day. No evil after-effects peculiar to the drug have been observed.

Duboisine.—H. Gellhorn [69, July 23] agrees with Ostermayer, that we have, in the sulphate of duboisine, a safe and valuable hypnotic, and one that in time, it is hoped, will replace the more dangerous hyoscine. The largest dose given in a single day by Gellhorn was 0.0022 gramme ($\frac{1}{30}$ grain), while the usual dose for men was 0.0012 gramme ($\frac{1}{50}$ grain), and for women 0.0008 gramme ($\frac{1}{80}$ grain). The drug was given hypodermatically one hundred times, and by the mouth twenty times. In 21 persons suffering from various forms of psychoses dryness of the throat was produced in several cases, but in only 2 old persons were unfavorable symptoms noted, and these were not alarming. The quieting action comes on in a few minutes after taking the drug. The pulse is slightly accelerated in from ten to fifteen minutes, but assumes the normal in half an hour. The respirations were affected in only 1 case. The sleep is quiet, and the patients on the following morning often desire to rest longer in bed. Preinniger[314 B.M.H.1,2] has also used the sulphate of duboisine, in doses of 0.002 gramme ($\frac{1}{32}$ grain), as a sedative and hypnotic. He finds its action prompt, and the sleep to last from one to eight hours.

Echinacea Augustifolia.—H. T. Webster[547 Aug.] finds echinacea augustifolia to be an antizymotic of great value. He has used it in diphtheria, typhoid fever, typhus fever, poisonous bites, etc., with success.

Elixir of Life.—See Animal Extracts.

Enemata.—The following enema is recommended by Charles P. Noble[9 Apr.25] in cases of obstruction of the bowels and in cases of obstruction due to paralysis of the bowels, especially after plastic operations:—

℞ Sulphate of magnesium, . . .	2 ounces (75 grammes).
Glycerin, ...	2 ounces (75 grammes).
Oil of turpentine, ...	½ ounce (15 grammes).
Water, ...	2 ounces (60 grammes).

Sig.: To be injected by a hard-rubber piston-syringe.

Epsom Salts.—A case of death is reported from the use of Epsom salts.[2 Aug.29] Arthur P. Luff[2 Sept.5] adds another, which occurred in 1887. A female, aged 30 years, in her usual health, on retiring at night, took an ounce (31 grammes) of Epsom salts. On the following morning she was found, in her room, dead. A careful post-mortem and chemical analysis yielded no evidence of any other cause of death.

Ergot—Ergotine.—John C. Hermeter [43 Aug.] finds that ergot produces contractions of the uterus by an essential primary action on the spinal cord, and is, therefore, a centric, not a peripheral, drug. Monory[212 Jan.10] effected a cure in a case of abnormal sweating in the region between the thorax and knees, by the use of ergot, after quinine and antipyrin had failed.

Aufrecht[54 July 15; 90 Sept.] advocates hypodermatic injections of ergotine, dissolved in distilled water. He employs the dialyzed ergot of

Bombelon, 1 in 9, with 2 drops of carbolic acid, and a quantity which will contain 1½ grammes (23 grains) of ergotine. He has never observed abscesses following the injections, which should be made in the subcutaneous tissue of the abdomen or the side of the thorax. In hæmoptysis he injects 3 grammes (46 grains) of the drug, and repeats it on the same day, if necessary. After the hæmoptysis had ceased he administered 1½ grammes (23 grains) three times a day for three days, consecutively. The same treatment is applied in uterine and vesical hæmorrhage. He states that ergotine causes pain when it is dissolved in impure water, alcohol, or glycerin. Aufrecht[116, May] also points out that a solution of ergotine can be preserved antiseptic for at least five days, if a few drops of carbolic acid be previously added to the solution. Biedert[116, July] has confirmed the experiments of Aufrecht. Ellinger[183, July 4] is of the opinion that ergot produces no vascular contractions, as is usually believed, but acts directly on the peripheral uterine ganglia. He also concludes that it has no direct action upon the blood-pressure, and must, therefore, have a specific action on the blood, which is thus more readily clotted at susceptible points in the vascular system. Roicki[1, July 26] has used the drug internally in the treatment of chronic blennorrhœa, and also in solution—5 grains to 10 ounces (0.32 gramme to 300 grammes) of distilled water—as a urethral injection several times daily, finding the cure to be rapid and permanent.

Ergotole.—William C. Kloman[1, June 6] has obtained excellent results from the hypodermatic use of ergotole in cases of hæmorrhage, abscesses, as in the case of ergot, being avoided. The same writer asserts that he has employed the drug locally, with success, in erysipelas, cellulitis, etc., having been able to restrain the hyperæmia.

Eseridine.—The hypodermatic injection of eseridine as a purgative is suggested by J. A. Flexner,[224, Apr. 11] experiments on the lower animals seeming to show that it possesses purgative properties when thus given.

Ether.—Sawyer[6, July 12, '90; 99, Feb. 26] recommends ether as a menstruum in medication of the skin, and says that such drugs as belladonna, iodine, menthol, and capsicum are especially suited for epidermic use when dissolved in ether. For instance, an ethereal tincture of menthol can be prepared in the strength of 1 drachm (4 grammes) to the ounce (27 grammes), and, when this is applied to the skin for the relief of neuralgic pain, the quick evaporation of the ether gives a grateful sensation of coldness, which supplements the analgesic action of the menthol. Attention is called by Eberhart[317, No. 12] to a case of paralysis following the subcutaneous injections of ether. Two injections were administered to a woman, which were followed the next day by paralysis of the middle and ring fingers. The author believes, with Remak, that ether produces neuritis, and that the anæsthetic should be injected where there are few nerves or where these are well protected, care being taken not to penetrate too deeply into the tissues. W. F. Rochelle[61, Dec. 20, '90] refers to a case of convulsions in a child, 4 years of age, where the administration of ether by inhalation produced a fatal result, in the course of a few seconds, from paralysis of the heart.

Ethyl Bromide.—See Bromides.

Ethyl Chloride.—Grandclément[211, Mar. 29] has reported to the Société des Sciences Médicales de Lyon 2 cases of temporal neuralgia, in which the local application of chloride of ethyl gave the most satisfactory results.

Eucalyptol.—Good results have been obtained by I. N. Brainerd[61, May 30] from the use of eucalyptol in the treatment of bronchial and pulmonary troubles. Thirteen cases are detailed to illustrate its therapeutic virtues, the best results being obtained in cases of chronic bronchitis and chronic interstitial pneumonia. The chief action of the medicine appears to be on the bronchial epithelium, producing at the same time a sedative effect upon the peripheral nerves of the respiratory tract. Eucalyptol is given in doses of from 5 to 10 minims (0.32 to 0.65 gramme) every four hours.

Eucalyptus.—Brendon Curgenven[2, v.1, p.783, '90] reports several cases of scarlet fever, in which most excellent results were obtained by the local application, as an inunction, of the oil of eucalyptus in combination with other antiseptics, such as camphor, thymol, etc. The disease was arrested and no rash or desquamation followed. The drug produced such a disinfectant action on the skin, mucous membranes, and secretions that the disorder was kept from spreading. The author was likewise able to prevent, by the same method, the spread of measles and chicken-pox. Ferd. von Mueller[267, May] praises highly the use of green eucalyptus branches in the sick-rooms of those suffering from infectious and contagious diseases,—branches to be placed under the bed and removed as soon as they wilt. A sedative and, to a certain degree, a hypnotic action is thus produced upon phthisical patients.

Euonymus Atropurpureus.—John A. Henning[192] praises this plant as one of the best cholagogues and renal hydragogues. He recommends its combination with cascara sagrada. The dose of the tincture is said to be from 5 to 10 drops, repeated according to indications.

Euphorbium.—Joseph Leidy, Jr.,[112] reports a case of poisoning by euphorbium. A man 35 years of age, while handling several specimens of the plant, accidentally rubbed his right eye. Severe irritation and profuse lachrymal secretion followed, the irritation gradually becoming general, with at first an increase and afterward a diminution of the buccal and nasal secretions. Sneezing was obstinate, and there was pronounced swelling of the right cheek, together with a marked conjunctivitis. Urination was markedly increased. The patient recovered next day, although the conjunctivitis persisted, yielding finally to local applications of atropia and boracic acid. The symptoms produced by the plant in this case are attributed by the author to an unusual susceptibility of the patient.

Euphorin.—Phenylurethan, or euphorin, the analgesic and germicide, must not be confounded with europhen, the substitute for iodoform, which has as its true chemical name isobutylorthocresoliod.

Ferdinand Adler[84] contributes an interesting paper on this new analgesic, phenylurethan, or euphorin, which was first used by Sansoni, and is described by him as having a formula $CO<^{OC_2H_5}_{NHC_6H_5}$ and as being a white crystalline powder with a weak aromatic smell and a slight taste resembling that of cloves. It is with difficulty soluble in cold water, easily so in a mixture of alcohol and water, and may, therefore, be administered in white wine. Methæmoglobin is never produced by its use, even in the case of an animal killed by large doses. Of 30 cases, including 3 of supra-orbital neuralgia, 1 case of chronic nervous headache, 3 of sciatica, 3 of acute polyarthritis, 9 of chronic articular rheumatism, 3 of muscular rheumatism, 2 of headache due to injections of Koch's lymph, and 6 cases of hemicrania, the best results were obtained in the hemicrania, supra-orbital neuralgia, and sciatica. Muscular rheumatism quickly yielded and joint rheumatism was improved. The first dose used was 0.20 gramme (3 grains), which was increased to 0.40 gramme (6 grains), three, four, and five times a day. Euphorin was also used as an antipyretic in 2 cases of phthisis, the temperature being reduced, in half an hour, from 39.9° to 37.9° C. (a reduction of 2° C. or 3.6° F.) in the one case, and in the other from 39.6° to 38.2° C. (a reduction of 1.4° C. or 2.5° F.). Adler has thus found phenylurethan to be a safe, quick, and efficient analgesic and antirheumatic, with a remarkable freedom from untoward effects in the way of vomiting, headache, and collapse.

A clinical study of euphorin has been made by Sansoni,[116 Sept.,'90; 1 Feb.4] who tried it in cases of fever due to typhoid, pneumonia, phthisis, acute rheumatism, orchitis, pleurisy, and influenza. In all these instances the antipyretic action was prompt, coming on in about three hours and lasting from five to seven hours. No untoward symptoms were observed, and during the period of apyrexia the patients felt perfectly well. The initial dose of the drug was 1½ grains (0.097 gramme), but the daily quantities in adults varied from 15 to 22 grains (0.97 to 1.43 grammes). In both acute and chronic rheumatism, however, the daily dose reached as high as 30 grains (1.94 grammes). To children under 15 years of age, 8 grains (0.52 gramme) a day were given, in two doses, with good results. The antipyretic power of the new drug was found to be twice that of antipyrin. The author thinks that euphorin has also analgesic properties, though not in a marked degree. It had no effect on migraine and intercostal neuralgia. In 1 case of chronic ophthalmia it acted satisfactorily as an antiseptic. From a series of observations, P. Giacosa,[580 Feb.26] also found it to act as an antiseptic against all forms of microbes and ferments. The drug is eliminated by the urine as phenylurethanate. In the lower animals, such as the frog, it produces, in sufficiently large doses, paralysis of spinal origin. Peroni,[6 July 4] has used euphorin in a series of venereal affections, judging, from the experiments of Giacosa, that the remedy would be useful in this class of cases. He used the powder, either alone or in the form of a salve, and an alcoholic solution, with good results in 54 cases of venereal ulcer, in 29 cases of syphilis of the mucous membrane, in 4 cases of balano-posthitis; also, in several cases of purpura of the head with alopecia, in 2 cases of blennorrhagia, and in 1 case of tuberculosis of the skin.

Europhen.—Europhen, or isobutylorthocresoliode, must not be mistaken for euphorin or phenylurethan. It is the iodide of isobutylorthocresol, and is obtained by the action of iodine on the latter substance. Its therapeutic action has been especially investigated by Eichhoff,[31 Sept.5] who finds that it is not poisonous, 30 to 45 grains (1.94 to 2.93 grammes) having no effect on dogs, and as much as 1 gramme (15½ grains) having been given to a man without producing unpleasant symptoms. It appears to be eliminated by the urine, as this contains iodine in patients that have taken the drug. Eichhoff has used the drug locally and hypodermatically, with much success, in the treatment of hard and soft chancres and secondary syphilitic lesions. When not used by itself, simply dusted over, an ointment in the strength of 1 to 2 per cent. was employed. For hypodermatic purposes the drug was used in doses of from ½ to 1 cubic centimetre (7¾ to 15½ grains) of a 1-per-cent. solution. The remedy also gave good results in varicose veins and ulcerated lupus, but was useless in eczema, psoriasis, favus, and other skin affections. In strong ointments it was irritating, and frequently produced eczematous eruptions. The best effects of the drug were observed when it was applied to moist and secreting surfaces. The ointment of europhen should be of 1- to 2-per-cent. strength.

W. Siebel[116 July] states that we have in europhen a new combination of iodine, which appears as a fine powder, sticky to the touch, yellow in color, insoluble in water, very soluble in alcohol, ether, chloroform, and oil. It contains 28.1 per cent. of iodine, and is prepared by adding iodine to isobutylorthocresol in the presence of an alkali. The amount of iodine eliminated by the urine is small, as was shown by an experiment, in which 1 gramme (15½ grains) of europhen, free from iodine, was held in solution by 0.65 per cent. of sodium chloride and injected into a rabbit. On the next day it was impossible to detect the presence of iodine in the urine, but during the whole of the next ten days a slight trace of iodine could be detected. The bacillus of typhoid fever, the bacillus of Friedländer, and the bacillus prodigiosus were scarcely influenced in their development, whereas the staphylococcus aureus and the bacteria of anthrax and of cholera were markedly affected. The results of the bacteriological experiments of O. Vulpius$^{69}_{\text{Oct. 30}}$ practically agree with those obtained by Siebel and Goldmann. The bacilli of anthrax were hindered in their growth, but not to such an extent as by iodoform. The bacillus pyocyaneus was but imperceptibly influenced. It was found that while europhen was less toxic when administered to animals than iodoform, it could not be said to be entirely free from toxic properties, as is stated by Goldmann and Eichhoff. The drug was used in 50 cases without toxic symptoms. There was also no irritation or eczema, except in 2 cases, in 1 of which a 2-per-cent. salve produced, on the third day, a slight irritation, and in the other case an eczema. In this case iodoform had produced the same result. Vulpius finds that the antitubercular properties of this drug are by no means so great as those of iodoform, but that it has certain advantages in its mild odor, its solubility, and in possessing but slightly poisonous properties in comparison with iodoform. Goldmann$^{2}_{\text{Aug. 15}}$ thoroughly describes the chemistry of this new compound, and states that it cannot be prescribed with starch or with most metals, as the free iodine causes discoloration. The substance is so light that a small amount can be dusted over a large surface, and it adheres very firmly.

Exalgin—Methylacetanilid.—Of 54 cases collected by Gorodichze,$^{64}_{\text{Feb.}}$ in which pain was the most prominent symptom, 44 successfully yielded to the analgesic influence of exalgin. The troubles for which the drug appeared to have an elective action were: neuralgic pain, migraine, facial neuralgia, and herpes zoster. The author contradicts the opinion of Dujardin-Beaumetz, who holds that it should not be given in elevated temperatures, and refers to 6 cases of cephalalgia, due to influenza, in which the pain disappeared in from one to two hours, without the drug producing the least depression in the patients.

The following potion is recommended by Gorodichze:—

℞ Exalgin, ...	0.80 gramme	(12⅓ grains).
Alcohol, ...	1.00 gramme	(15½ grains).
Honey-water, ...	100.00 grammes	(3⅜ ounces).

M. Sig.: To be taken in two doses, eight hours apart.

From a study of the action of exalgin in a large number of nervous disorders, Moncorvo$^{67}_{\text{May 30}}$ believes that he has found in exalgin a superior analgesic to antipyrin. From the study of

21 cases of children, varying in age from 1½ to 12 years, and suffering with various painful affections, such as neuralgia, migraine, toothache, gastralgia, torticollis, etc., he finds 0.05 to 0.10 gramme (¾ to 1½ grains) three times a day most effective. A favorable result was also obtained in 1 case of chorea. Careful histories of all these cases are added, and his conclusions summed up as follows: The favorable analgesic activity of methylacetanilid has been demonstrated in 21 children suffering from different painful affections. In all, the medicine was well tolerated. Certain accidents, observed in adults, as buzzing in the ear, have not been noted. The dose first given was 0.05 gramme (¾ grain), but finally increased to 0.30 gramme (4⅗ grains) in the twenty-four hours. It may be administered dry on the tongue, in cachettes, and dissolved in wine or in water, to which a little alcohol has been added. Everything being equal, exalgin is to be preferred to antipyrin on account of the smallness of the dose and the freedom from untoward effects. Its success in 1 case of chorea would show that it has a field of usefulness as a nervine.

The analgesic properties of exalgin are vouched for by C. Ferreira,[64 Mar.] 7 cases of various disorders, in which pain was prominent, being markedly relieved. The ages of the patients varied from twelve to forty-six years, and the dose of the drug from 3 to 6 grains (0.19 to 0.39 gramme). Amelioration was comparatively prompt, and no disagreeable after-effects were observed. Tolerance was perfect. Comparatively large doses of this drug have been used by Desnos[35 Feb.15; 25 Mar.] in the treatment of various kinds of neuralgias, in the lightning pains of locomotor ataxia and in those of rheumatism. The author has ordinarily employed doses of from 4 to 12 grains (0.26 to 0.78 gramme). No unpleasant symptoms were produced, and when any occurred, such as cyanosis, the duration was short. He asserts that in some cases as high a dose as 24 grains (1.55 grammes) may be given without producing any cyanosis or other untoward effect.

E. T. Flynn[2 Jan.10] reports a case of poisoning by two 3-grain (0.19 gramme) doses of the drug in a boy 14 years of age. The symptoms came on about an hour after the administration of the second dose, and consisted of great dyspnœa, intermittent pulse, and dilatation of the pupils. Recovery took place under hypodermatic injections of ether and alcoholic stimulation. The author condemns the drug as dangerous in large doses, and has found it of no use, as an analgesic, in small quantities. D. Gair Braidwood,$^{2}_{\text{Jan.17}}$ believes that the bad symptoms following the ingestion of exalgin in Flynn's case were due to the comparatively large dose employed. Braidwood has used the drug extensively, with marked success, in the alleviation of pain, and never observed disagreeable effects. He thinks it unwise to employ the medicament, even in small doses, in patients convalescing from febrile disorders, owing to the weakened condition of the heart. The case of a man, 60 years of age, who was given by mistake two 1-gramme (15½ grains) doses of exalgin for two consecutive days, until 1 drachm (3.89 grammes) in all had been taken, is reported by Buisson.$^{67}_{\text{Mar.15}}$ Dyspnœa and marked cyanosis were produced. The symptoms lasted for two days, and finally disappeared, without leaving any other unpleasant effects. Two cases of poisoning by overdoses of exalgin are reported by Arthur Conning Hartley.$^{6}_{\text{Mar.7}}$ The patients, females, took repeated 3-grain (0.19 gramme) doses of the drug for the relief of neuralgic pains, and in both distressing symptoms appeared: a feeling of impending death, gasping respiration, dilated pupils, disturbed pulse. In 1 of the cases profuse perspiration was observed. Both patients, however, recovered under the use of stimulants and fresh air. No rash was noticed, but prostration in 1 case lasted for several days. The author has, however, obtained satisfactory results from the use of the drug as an analgesic in small doses.

Exostemma Caribæum.—According to F. Altamirano,$^{792}_{\text{Apr.}}$;$^{673}_{\text{Sept.}}$ this plant, which belongs to the Rubiaceæ family, possesses antiperiodic properties. (Report of Semeleder, corresponding editor, Mexico.)

Ferrum.—See Iron.

Ficus Carica—Cradine.—This new peptic ferment occurs, according to U. Mussi,$^{614}_{\text{Nov.,'90}}$;$^{673}_{\text{Nov.}}$ in the leaves and twigs of the *Ficus carica.* It is said to act, in the presence of hydrochloric acid, more powerfully than pepsin. Even in alkaline media, cradine exercises a peptonic action. It does not seem to affect hydrocarbons in any way.

Fluorescein, Fluorescin.—Frank Trester Smith$^{61}_{\text{Sept.26}}$ recommends the use of fluorescein and fluorescin in cases where there is much photophobia, as it enables the physician to tell much more easily and quickly to what extent the cornea is involved. It is also of use to the general practitioner, whose eye is not as practiced in finding foreign bodies as that of the specialist. Smith also found this drug useful in determining whether strictures of the nasal duct were impervious. The needle of a Knapp lachrymal syringe was inserted into the punctum, and the solution forced into the lachrymal sac. If the canal was open some of the green fluid was forced into the nose, and could be blown out on the handkerchief. R. L. Randolph[48, Jn.] believes that fluorescein has not proved of benefit in the hands of certain observers, because they either used an impure article or used the wrong variety of fluorescein. The red fluorescein is the only variety which gives reliable results. The readers of the ANNUAL will remember that this drug is used as a means of diagnosing corneal lesions, and was introduced by Thomalla.[190, Nov.,Dec.,'89]

Galega.—Carron de la Carrière[24, Feb.15,'89] finds that galega meets the indications of a true galactagogue, as it increases the quantity of the milk without diminishing its richness. He prefers an aqueous extract, and gives as much as 1 to 4 grammes (15½ to 62 grains) in the twenty-four hours, in doses of 0.5 to 1.0 gramme (7¾ to 15½ grains). Numerous cases are cited in which the drug acted so favorably upon the mother that the child rapidly increased in weight and strength.

Gallacetophenon.—For the treatment of skin diseases, especially psoriasis, this substance has been brought to the notice of the profession,[26, Nov.] as a substitute for pyrogallol. It is a derivative of pyrogallol, occurring as a yellow powder, readily soluble in hot water, ether, alcohol, and glycerin. It possesses antiseptic properties, and it was found that 1-per-cent. solutions of gallacetophenon entirely prevented the development of bacteria; micrococci of pus six days old were destroyed in twenty-four hours. In psoriasis it has been used, in the form of ointment of 10-per-cent. strength, with satisfactory results. It does not soil linen, which is an advantage.

Gelsemium.—Edward Jepson[2, Sept.19] reports a case of poisoning from the tincture of gelsemium administered to a woman, aged 40, suffering from severe neuralgia; 10-minim (0.65 gramme) doses every two or three hours were given the first day, and, no relief being obtained, 20-minim (1.3 grammes) doses were administered for another twenty-four hours. Symptoms of poisoning then came on, consisting in a total loss of power in the tongue, alteration in vision, with widely dilated pupils, and uncertain power of the muscles of the hand and arm. The patient was perfectly conscious, and nodded her head in answer to any questions. She seemed greatly alarmed in regard to her own condition. The $\frac{1}{120}$ grain (0.00054 gramme) of strychnine was injected, and in ten minutes a change for the better was noted. Later on, the same amount was again given, and she was soon able to take food and stimulants, and the paralysis disappeared. The vision was not perfectly restored for some hours, the pupils becoming gradually less and less dilated. It is noted that she has had some return of neuralgia, but has been in better health than previous to the administration of the drug. Given in small doses,—that is, a teaspoonful of a solution containing 5 drops of the fluid extract in 4 ounces (120 grammes) of water,—gelsemium, according to J. Lindsay Porteous,[36, Dec.,'90] has produced excellent results in cases of pneumonia; these were even more satisfactory when the drug was combined with aconite in the same proportion. An editorial[80, Feb.] reviews the literature of gelsemium. J. F. Griffin[176, Aug.] thinks that in remittent and intermittent fevers, when the temperature is high, the pulse rapid or full, the pupils contracted, breathing rapid, full doses of this drug should be given. J. A. Muenich[186, Aug.] thinks that 10-minim (0.65 gramme) doses of the fluid extract of gelsemium are too much. He cites his own case, in which his pulse was reduced to 42 by an 11-drop dose.

Gentian.—This drug, according to Ferray,[164, May 28] is capable of exciting the automatic centres of the stomach, and of thus exaggerating its movements. In connection with this, he has found that other bitters, such as cetrarin, condurango, bisulphate of quinine, and the extract of quassia, though to a less degree, also increase the movements of the stomach.

Germicides.—See Antiseptics.

Ginger.—Two cases of poisoning by wild ginger, occurring in a woman and a little girl, are reported by Mitchell.[9, Mar.7] The symptoms were those of pain in the mouth, throat, stomach, and bowels,—of a burning character; an erysipelatous eruption, the skin being thickly covered with pimples and vesicles; pronounced swelling of the face, hands, and fingers; rigors, fever, a frequent pulse, and nausea and vomiting. Subsequently, similar symptoms appeared about the anus, vulva, labiæ, nymphæ, and vagina, accompanied with a constant desire to urinate; micturition was painful and difficult. The patients finally recovered, the woman in about two weeks.

Ginseng.—The Chinese ascribe to ginseng the most wonderful healing properties, even going so far as to claim that it will cure consumption when half the lungs are gone. It is used, boiled, for headache, colds, fever, and pains in the stomach. T. G. Stephens[176, Aug.] states that in America the *Panax quinquefolium* is much used as an anodyne in the treatment of the after-pains of labor. One case is cited showing its use in this class of cases.

Gold.—Joseph Drzewiecki, corresponding editor at Warsaw, Poland,[673, May] has cured a case of lupus by the internal administration of the chloride of gold, in doses of $\frac{1}{150}$ grain (0.00043 gramme), three times daily. Better results can probably be obtained if the drug be given hypodermatically. Gold is now being used, in the hospital at Warsaw, in the treatment of patients suffering from phthisis.

Guaiacum.—William Murrell[121, Jan.] thinks that the best use of guaiacum is as a laxative or purgative. In 1 case in which this drug was prescribed, a well-marked rash, resembling that of copaiba, covered the arms and legs of the patient. It was accompanied by intense itching, and disappeared upon the withdrawal of the drug.

Hæmoglobin.—Pietro Castellino[41, Apr. 30] finds hæmoglobin of great value as a therapeutic agent in impoverished conditions of the blood. It was rapidly and constantly absorbed and produced no gastric symptoms; there was a rapid increase in the number, size, and quality of the red blood-corpuscles and a return to their normal color, and the appetite was increased. The hæmoglobin should be continued until the normal standard is reached; 1½ grains (0.097 gramme) daily is sufficient for this purpose. If there is no digestive trouble, other preparations of iron can be given at the same time, and the beneficial results will be quicker and more apparent.

Halviva.—G. Yeates Hunter[2, Mar. 7] desires to call attention to halviva, prepared from an Indian plant, kreat, as a substitute for quinine. The drug has been used, in the form of an infusion, for many years in India, and is considered of great service as a tonic and restorative. Hunter considers that it can be taken as a prophylactic with great advantage. It is also useful in indigestion, accompanied with constipation, and in gouty dyspepsia.

Hydrargyrum.—See Mercury.

Hydrastine, *Hydrastinine.*—See Hydrastis.

Hydrastis Canadensis.—Joseph Adolphus[190, Feb.] states that he has cured several cases of so-called spinal irritation by a combination of hydrastis and podophyllum. As a general tonic, he recommends this drug in combination with podophyllum, nux vomica, and taraxacum, believing it to be both a vasomotor stimulant and a heart-tonic. W. C. Quincy[192, Nov.] thinks that it is not as much prescribed as it should be. Not only does it possess decided tonic action, such as is observed in gentian and quassia, but it is also useful in all chronic, subacute, or catarrhal inflammations of those organs lined with mucous membrane. The drug has been found of service by Cruse[58, Oct. 8] in the treatment of the night-sweats of a large number of cases of hæmoptysis, their suppression lasting for even three weeks after the stoppage of the remedy. The dose employed was 30 minims (1.87 grammes) of the fluid extract.

Reynold W. Wilcox[1, Dec. 13, '90] thinks that we have in hydrastis, viburnum, and piscidia a combination of remedies which will be found useful in all cases of hyperæmia of the female reproductive system. K. Serdzew[2015] has found that small doses of hydrastine—0.0016 to 0.0024 gramme ($\frac{1}{40}$ to $\frac{1}{25}$ grain) per kilo ($2\frac{1}{2}$ pounds) weight of the animal—are sufficient to bring on uterine contraction, and that such doses are not dangerous, as the blood-pressure, breathing, and nervous system were not in any way influenced. Tetanic convulsions and diminution of blood-pressure and of the frequency of the pulse were only noticed when toxic doses—.02 to .04 gramme ($\frac{2}{7}$ to $\frac{3}{5}$ grain) per kilo ($2\frac{1}{2}$ pounds)—were used. The author finds that the action upon the uterus is different from that of ergot, in that it is of central origin, while ergot contracts the uterus through its action upon the nervous and muscular elements. P. Archangelski[580, p. 66] has found that abortion can be produced—not only at term, but also in the middle of conception—in rabbits, mice, and dogs by the use of hydrastinine. As this drug was found to have a cardiac action, it was tried in 2 cases of heart disease, the result being positive in one and negative in the other.

Hydrogen Peroxide.—B. W. Richardson[6, Mar.28; Apr.4] began his investigations on the therapeutic uses of this drug as early as 1858. He especially recommends its internal administration in diabetes, phthisis, pertussis, syphilis, and angina pectoris. In diabetes he combines it with codeine in the following prescription :—

℞ Codeine,	gr. iij	(0.19 gramme).
Alcohol (sp. gr. 830),	f℥ij	(54.00 grammes).
Solution hydrogen peroxide (10-vol. strength),	f℥ij	(60.00 grammes).
Aq. destill., q. s. ad	f℥xij	(360.00 grammes).

M. Sig. : One-half fluidounce (15 grammes), twice daily, in a wineglassful of water.

In pertussis 10 to 60 minims (0.60 to 3.38 grammes) of ozonic ether in dilute alcohol is given in water, four times a day. The ozonic ether is prepared by agitating a 30-volume solution of the peroxide with anhydrous ether (equal volumes). In syphilis Richardson considers that this drug has an intermediate action between mercury and potassium iodide, and that, while it may produce ptyalism, the stoppage of the hydrogen peroxide soon causes the excessive flow of saliva to cease. It is given in all stages, and may be used either alone or in connection with the usual remedies.

Paul Gibier[138, Jan.] has made some experiments, in order to determine its antiseptic action on the following pathogenic microbes: bacillus anthracis, bacillus pyocyaneus, bacillus of typhoid fever, of Asiatic cholera, of yellow fever, streptococcus pyogenes, microbacillus prodigiosus, bacillus megaterium, and the bacillus of osteomyelitis. The strength used was about 1.5 per cent., corresponding to about 8 volumes of oxygen, after the culture had been added to the hydrogen peroxide. The destructive action of the hydrogen peroxide is stated to have been almost instantaneous. Even after contact for a few minutes, cultivation of the microbes was found to be impossible. Experiments were also made with hydrophobic virus, with a total destruction of its virulent properties. The author considers that he has obtained some interesting facts in regard to the action of the drug upon the tubercle bacilli, and hopes at some future date to make further announcements in this direction. Gibier believes that the drug possesses no toxic properties, as 5 cubic centimetres (1¼ drachms) injected beneath the skin of a guinea-pig produced no serious results. It is recommended in all cases where the microbian element is directly accessible,—more especially in infectious diseases of the mouth and throat. N. Pane$^{727,25}_{20;\,\text{Jan.}}$ has found hydrogen peroxide of great use in fungous ulcers and cold abscesses, possessing, in the proportion of 1 to 100, an energetic disinfecting power. A solution of 1 to 1000 is too weak, and is inferior to the corresponding solution of corrosive sublimate. A solution in nutritive substance of 1 to 352 not only impedes the development, but after some days kills the spores of the bacillus of charbon. A solution of hydrogen peroxide in nutritive substance from 1 to 352 to 5052 impedes their development, but does not deprive them of their growing power when transferred to other nutritive media. Its action is stronger against the charbon bacilli than is the bichloride of mercury.

In about 40 cases in which it was used by Buck$^{760}_{\text{Jan.}3}$ as good results were produced as by the bichloride of mercury, and in some cases better. In only three instances, in which it was applied to recently-denuded surfaces, did it give rise to pain. In one case of syphilitic rupia, in which mercury was harmful, peroxide of hydrogen caused the sores to heal. Buboes were cured in from three to four weeks, more rapidly than by the bichloride and the iodoform pack. No good resulted, however, in 2 cases of gonorrhœa in which it was tried. Robert T. Morris$^{663}_{\text{Feb.}}$ calls it the "Necessary Peroxide of Hydrogen," on account of the great esteem in which he holds it. Attention is again called by him to the well-known fact that care should be taken not to use the hydrogen peroxide in the neighborhood of the hair, if the color of the hair is a matter of any importance to the patient, as this drug is used for the purpose of bleaching the hair to a golden color. Gabrilowicz$^{296}_{\text{p.}64}$ has given, twice daily, inhalations of the hydrogen peroxide to patients suffering from affections of the air-passages. He uses at first a 1-per-cent. solution, gradually increasing the strength. In tuberculous laryngitis a 5-per-cent. solution is used at first. F. W. Frankhauser$^{760}_{\text{Aug.}15}$ has used it with success in 22 cases of suppuration of the middle-ear. In ozæna and rhinitis it is used in 10-per-cent. strength.

Hyoscine, *Hyoscyamine.*—See Hyoscyamus.

Hyoscyamus.—Philip Zenner$^{144}_{\text{Apr.}}$ favors the use of the hydrobromate of hyoscine, especially in motor restlessness and in maniacal conditions. In the latter cases he has given as high doses as $\frac{1}{10}$ grain (0.0065 gramme), hypodermatically. Illustrative cases are given by Lionel Weatherly[166 July] to show the beneficial therapeutic uses of this powerful drug. From the results obtained, the author believes hyoscine to be most valuable as a mental alterative in nervous disorders, in which it must be given in small, and, if necessary, repeated doses. Its good effects are next best seen in the treatment of multiple sclerosis, chronic alcoholism, paralysis agitans, and even in general paralysis, in which it acts especially in regulating lost co-ordinating power. Hyoscine, however, must not be used indiscriminately, as its abuse will do more harm than good. It was found of no value in mental depression. The author uses the drug in doses of from $\frac{1}{300}$ to $\frac{1}{100}$ grain (0.00022 to 0.00065 gramme), increasing it cautiously up to $\frac{1}{50}$ grain (0.0013 gramme). He advises a sterilized solution, with 5 grains (0.32 gramme) of boric acid to the ounce (30 grammes), and recommends as antidotes, in cases of poisoning by it, pilocarpine and caffeine. The chloride of hyoscine was given by Oringe[373 v.9,No.16] to 47 patients, in doses of 0.001 to 0.003 gramme ($\frac{1}{64}$ to $\frac{1}{22}$ grain). In various forms of chronic psychoses, in which other narcotics had proved themselves of no value, the drug was continued as long as six months, with but slight interruption, and gave, as a rule, eight hours' rest. In 25 per cent. of the cases, however, it could not be used, either on account of the dryness of the mouth, because the patient became accustomed to its use, or because an exciting instead of a quieting effect was produced. A case of poisoning by hyoscyamine is reported by Hugh Hagan.[117 Oct.] A man, 57 years old, was given, for a nervous affection, a dose of $\frac{1}{24}$ grain (0.0027 gramme) of hyoscyamine, which was soon followed by symptoms of great prostration,—flushed face, severe headache, soreness of throat and tongue, total blindness, dizziness, tinnitus aurium, and great muscular weakness. The heart was depressed, the respiration slightly increased in frequency, and there was considerable mental confusion. The author says that the same patient possessed an idiosyncrasy against quinine, and such might be the case in the present instance, as the quantity of hyoscyamine given was below the usual dose employed. Berruyer, of Nantes,[229 Apr.] writes that he was able to reduce a left crural hernia, after taxis had failed, by means of belladonna ointment and ice to the tumor, and the internal administration, frequently repeated, of hyoscyamine and strychnine. Lemarié[229 Apr.] reports that reduction could only be accomplished, in a right strangulated inguinal hernia, after the patient had taken, dosimetrically, 30 granules of hyoscyamine and the same number of granules of sulphate of atropine, followed by 45 grains (2.93 grammes) of chloral hydrate in 1 ounce (37 grammes) of the syrup of morphia.

Hypnal.—We have already noticed, in the ANNUAL, the observations of Bardet in regard to the value of hypnal as a therapeutic agent. Germain Sée[25 Mar.] gives us now the results of his studies with the same drug, and his conclusions are somewhat different from those of the first observer. It must be remembered that two substances are obtained by the combination of chloral and antipyrin,—the monochloralantipyrin and the bichloralantipyrin. Both of these drugs have been studied by Sée, who finds: 1. Both bodies, in doses of 45 grammes (1½ ounces), act as hypnotics comparable to chloral. 2. They have no paralgesic effect. 3. They should not be given in cardiac cases, especially if there be failure of compensation. 4. In aortic disease, if compensation be complete, they may be used with advantage. 5. They have no action in dyspnœa, whether cardiac or pulmonary in origin. 6. They may in some cases produce slight diuresis. 7. They are almost as irritating to the digestive tract as chloral. 8. From their depressant action on heart and vessels, they must be considered as far inferior to sulphonal and the other hypnotics of the chloral series, such as chloralamid and chloralimid. On the whole, the results of Sée are more in accord with those obtained by Quinquaud. Demande[90 June] prepares hypnal by taking a solution of 47 grammes (1½ ounces) of chloral hydrate in 50 cubic centimetres (1¾ ounces) of distilled water, and mixing this solution with 53 grammes (1⅞ ounces) of antipyrin in 50 cubic centimetres (1¾ ounces) of water. An oily-looking liquid is formed, which is drawn off and allowed to stand for twenty-four hours. At the end of this time it will be found that almost the entire mass is filled with transparent rhombic crystals. These should be drained and dried between folds of filter-paper, or, under a glass, with sulphuric acid.

Hypnotism.—We are pleased to notice that hypnotism continues to be treated, philosophically and clinically, from a scientific point of view, and not as is generally considered by the ignorant, the superstitious, and the *charlatan.* Five cases have been reported by J. Milne Bramwell[2, Feb. 23] in which cures were obtained by the induction of the hypnotic state and subsequent *suggestion.* The diseases comprised aphemia, hyperidrosis, otorrhœa with deafness, operation for strabismus, and intercostal neuralgia. The first 4 cases were girls from 4 to 20 years of age. The fifth was a boy of 18 years. In the case of strabismus the anæsthesia was induced by hypnotism. After detailing each individual case, the author states that it is his practice to suggest to the patient that he or she should be hypnotized by no other one but himself, and that this measure was a safeguard against abuse. In a severe case of pruritus vulvæ, he failed to hypnotize the patient for sixty-seven times consecutively, but succeeded the sixty-eighth time, when the woman became a perfect somnambulist. Some success was obtained in cases of epilepsy, epileptiform neuralgia, and chorea.

J. H. Whitham[2, Feb. 23] reports a case of infantile hemiplegia, in which improvement was produced after hypnotization for three months. The author believes that every individual capable of displaying functional nerve-disturbance may be successfully hypnotized, and that his experience led him to consider hypnotic treatment for organic lesions unsuccessful. H. Ernest Schmid[1, Jan. 17] reports 4 exceedingly interesting cases entirely cured by the exclusive use of hypnotism. Two of the cases were of hysterical insanity in girls 16 and 22 years of age, respectively. The third case was of neuralgia in a young lady, and the fourth, a most remarkable one, was a case of inflammatory rheumatism of the wrist. In this, the simple administration of 12 sugar-of-milk pills, to be taken in doses of 1 every three hours, with the suggestion that after the last pill was ingested the disorder would disappear, was sufficient to cause the patient to become entirely well. Luys[24, Mar. 16] publishes the statistics of the disorders treated by therapeutic methods derived from hypnotism, which he divides into "fascination," "transference," and "magnetic currents combined with electricity." The number of patients treated was 128, and of these 67 are returned as cured, 51 as ameliorated, and in 10 no change was produced. Hysterics figure largely in the list, numbering 49. Paralysis agitans comes next, and of these 3 out of 9 were cured. According to this author, high as the percentage of non-cures is, it would seem that those spending hours in the hopeless task of searching for the pathology of this disease would be more profitably employed in administering hypnotism to their patients. Epileptics were equally benefited by "transference," as were cases of neuralgia, writers' cramp, tabetics, and other psychical cases having a cerebral origin. In obstetrics, women were delivered without pain or danger by the "fascination" method, and even in organic diseases of the heart "transference" was attended with marked improvement. In conclusion, it is declared that these methods of hypnotic treatment give, in acute or chronic diseases of the nervous system, 50 per cent. of cures.

Two cases of disease by imagination are reported by William B. de Wees,[72 Pa.] in which a cure was obtained by suggestion. Both cases occurred in women: one of these imagined that she had paralysis of the legs, through paternal inheritance, and for nine years was actually confined to bed and chair, from a supposed inability to walk. After so long a period of imaginary suffering, *one* single suggestion was sufficient to effect a cure. The other patient imagined that she had a tape-worm, and was cured when she was made to expel the imaginary animal. The author discusses at length the subject of suggestion, and, among other things, states that those who undertake miraculous cures do not deny the presence of the disease, but affirm it through the action of a superhuman power; that they act by suggestion, gradually inculcating the idea that the disease is curative, and the patient, impressed with the notion, makes it his own; that thus cures are often effected, in consequence of suggestion, and, when we say *it is faith which saves* (*cures*), we make use of an expression which is rigorously scientific; that to deny these miracles is no longer the question; the point is to comprehend their genesis, and to learn to imitate them.

An interesting communication is published by W. C. Delano Eastlake,[19 Sept.] with detailed reports of 6 cases. The first was that of a woman, 30 years of age, suffering from facial neuralgia of several months' standing. Remedial agents had done her no good. A single treatment by hypnotization sufficed for a complete cure. The next one was that of a woman, about 40 years of age, who was greatly relieved of an obstinate nervous dyspepsia. In the third case success was also obtained in the treatment of vomiting of pregnancy. The fourth was a remarkable case, in which a woman with a narrow pelvis, and who had always suffered intensely at childbirth, was, after being treated five times by hypnotic suggestion, safely delivered of a healthy child, without the least difficulty. The other 2 cases were of mental depression in the one and of despondency and incipient melancholia in the other, occurring in young women, both conditions being caused by grief, and ultimately cured. The same happy results are said by the author to have been obtained in 2 other cases of nervous dyspepsia. With regard to neuralgia, he affirms that he has effected a permanent cure in about 10 per cent. of the cases treated by hypnotic suggestion. The writer describes his particular method employed in the treatment, and finally concludes by saying that hypnotism has a place in therapeutics as legitimate as electricity, massage, or rest-cure, and that the mind of the profession should not be blinded to any good, surrounded though it may be by mysticism and the vagaries of charlatans.

Draper,[26 July] details 7 cases of women suffering from uterine troubles, in which satisfactory results were obtained by hypnotic treatment. The chief diseases were amenorrhœa, dysmenorrhœa, dyspepsia, constipation, menorrhagia, abdominal and thoracic pain, vomiting, hystero-epilepsy, and others. The author states that, although he has treated many cases by pessaries, these, when combined with suggestion, have done by far better service. With the expectant attention induced by suggestion during hypnosis, he has observed results truly marvelous, and believes that hypnotism will obtain a place and keep it in practical medicine.

Dujardin-Beaumetz,[67 Jan.15] summarizes his own individual views as follows: "Thanks to the more attentive study of the phenomena of suggestion, we are able to-day to establish the basis of psychotherapy; but this psychotherapy will never be anything but an exception in the practice of our art if we insist on limiting it to the phenomena of hypnotism, properly so called; for, as I have shown you, from the foundation of medicine up to our own times, suggestion—*i.e.*, the influence of the physician on his patient—has played, and always will play, a considerable rôle in the result of the treatment which he orders. We have here a fact which applies to the entire group of animal life, and which finds expression in the statement that certain beings have an influence over their fellows; but there will always remain that great group of pathological states which constitute diseases, properly so called,—the pneumonias, typhoid fever, rheumatism, etc.,—against which we must employ an especial medication, in which hypnotism can have no part; and to suppose, for a single instant, that one may, by simple affirmation, cause the entire *cortége* of morbid symptoms to disappear is a delusion, and, worse than that, an error."

George Foy[16 July] contributes a lengthy article on suggestive therapeutics. The author, while endeavoring to examine the subject historically and philosophically, assumes a more or less sarcastic attitude, and concludes by saying that, "if men seriously assert that they believe the published reports of some of the hypnotic miracles, nothing can be said. Ordinary mortals weigh probabilities before deciding; but those who accept the statement that a 'suggestion' can change a rogue's moral character, or convert a stupid boy into a preternaturally intellectual one, possess more than the mustard-seed measure of faith."

A. B. Richardson[58 Feb.14] writes more or less favorably on the therapeutic value of hypnotism, but is decidedly opposed to public exhibitions of the treatment, because this display of the phenomena encourages credulity, bigotry, and charlatanry among the people. He also speaks of the harmful results produced by its abuse, and believes that there is but one class of cases in which its use *ad libitum* is justifiable, and that is in persons who already possess such defective inhibition as to be in a pathological state. In such cases, though the hypnotic influence is difficult to establish, when successfully done, it sometimes leads to such a fixation of conduct in a right direction as results in decided benefit. A powerful address was delivered by Eskridge,[1 Aug.1] in which the author, basing his statements upon a large experience, expresses the opinion that the value of hypnotism as a therapeutic agent depends upon the mental impression produced and the permanency of the same. He strongly urges the legal restriction of licenses to physicians and scientific investigators, owing to the danger accruing from the practice of the ignorant and incompetent. J. T. Clegg[506 Aug.] divides the disorders in which suggestion has done good into three classes: those of a hysterical nature; neurasthenic and hypochondriac cases, afflicted mostly by imaginary ailments; those cases in which suggestion acts merely as an auxiliary, and exercises but comparatively little power. In a well-written review$^{6}_{\text{Apr.4;}}{}^{9}_{\text{Oct.10}}$ several recent works are noticed, chiefly those of Albert Moll, R. W. Felkin, Norman Kerr, Otto Wetterstrand, and Augustus Nicoll. Moll believes that the conditions amenable to suggestion are "all kinds of pains which have no anatomical cause (headaches, stomach-aches, ovarian pains, rheumatic and neuralgic pains), sleeplessness, hysterical disturbances (particularly paralysis of the extremities and aphonia), disturbances of menstruation, spontaneous somnambulism, uneasy dreams, loss of appetite, alcoholism and morphinism, neurasthenic ailments, stammering, nocturnal incontinence of urine, pruritus, writers' cramp." The author regards pronounced hysteria as comparatively rebellious to suggestion, and while he believes that slight forms of mental disease, such as mania and melancholia, are amenable to the treatment, insanity is considered as difficult to influence by hypnosis. In order to avoid unpleasant after-effects from hypnosis Moll recommends: 1. To avoid continuous stimulation of the senses as much as possible. 2. To avoid all mentally exciting suggestions as much as possible. 3. To do away with the suggestion carefully before the awakening.

Felkin simply makes a plea for a further inquiry of the subject. Kerr writes against public exhibitions, considering these as disgusting and degrading. Wetterstrand comments favorably on the system, and Nicoll, who is an ardent adherent of the Nancy school, thinks that "not only disease, but some of our most crying social evils, may be alleviated by a careful and expert application of hypnotism." Wetterstrand has studied the subject in over 3000 cases, comprising such diseases as rheumatism, epilepsy, morphinomania, and others. Ringier publishes a record of 210 cases, and carefully scrutinizes his successes and his failures. This author divides his cases into 7 groups: 1. Neuroses pertaining to the motor, vasomotor, or secretory systems. 2. Neuroses of the emotions, or neuralgias. 3. Insomnia. 4. General cerebral neuroses or psychoses. 5. Rheumatic affections. 6. Intoxications. 7. Sundry affections. Liébeault treats especially of animal magnetism. Schrenk-Notzing writes on the influence of drugs upon the suggestibility of the patient, with especial reference to its increase by cannabis Indica. The psychological aspects of hypnotism form the especial subject of a contribution by Janet. Bernheim devotes most of his volume to the details of clinical histories of cases, in which he claims that hypnotic suggestion has been able to effect cures in a large number of cases of multiform nervous diseases. Preyer deals simply with the development of the science, as put forth by Braid, Heidenhain, Charcot, and other authorities.

Hyposulphite of Soda—Thiosulphate of Soda.—G. F. Cadogan-Masterman[26 Apr.] favors the use of small doses of hyposulphite of soda in the treatment of obstinate cases of flatulent dyspepsia. The danger of prescribing large doses is, that the gastric juice is rendered inoperative, while at the same time fermentation is checked. He recommends that 5 grains (0.32 gramme) be given at a dose, and finds the following prescription useful:—

℞	Tr. gentianæ comp., . . .	ʒij	(7.78 grammes).
	Tinct. capsici, ...	ʒss	(1.94 grammes).
	Sodii sesquicarbonatis, . . .	gr. 120	(7.78 grammes).
	Sodii hyposulphitis, ...	gr. 40	(2.59 grammes).
	Chloroformyli, ...	gtt. viij	(0 50 gramme).
	Aquam, ... ad	℥viij	(240.00 grammes).

M. Sig.: Two tablespoonfuls thrice daily.

Ice.—Sevestre[439 Mar.] makes a report to the Société Médicale des Hôpitaux for a committee organized to test the value of the treatment of diphtheria by ice. Small pieces of cracked ice are to be placed in the mouth of the child every ten minutes. This is to be kept up day and night. It is found not to interfere with the child's sleep. The ordinary antiseptic treatment should be employed at the same time. The use of ice, internally and externally, in the treatment of diphtheria, is recommended by Mayer,[26 May] who has employed this method exclusively for sixteen years, and affirms that he has not lost a single patient, and that only occasionally was the larynx involved. Chlorate of potassium, in this connection, was also used internally in small doses.

Ichthyol.—An excellent contribution to the uses of this important drug is published by T. Cranstoun Charles.[6 Sept.26] A large number of cases suffering from the following disorders were treated with success: Burns, erythemata, herpes zoster, eczema, acne, sycosis menti, psoriasis, pityriasis capitis, prurigo senilis, boils and carbuncles, erysipelas, rheumatism, gout, neuralgias, contusions, and catarrhs. The drug was employed locally and internally. The dose, when given by the mouth, may be increased to 15 grains (0.97 gramme) a day, without producing any evil results. Locally, it may be mixed with lanolin, zinc ointment, or glycérin, varying in strength from 5 to 50 per cent. For a regenerative action, the weak ointments are better; for a resolvent action, as in gout, rheumatism, and neuralgias, the strong ones are recommended. In 2 cases, carefully observed, the author noticed, under the administration of the drug, not only an increase in bodily weight, but improvement in the general health. He believes with Zuelzer, that by its use the disintegration of the albumen in the system is retarded, while the formation and accumulation of these is favored. The author calls attention to the use of cumarin to disguise the peculiar smell of ichthyol. F. Vigier[3, Feb. 18] finds that after several days the stomach can tolerate 2 to 5 grammes (½ to 1¼ drachms) of ichthyol, and believes that the therapeutic action is largely due to the 15 per cent. of sulphur which it contains.

According to Richard Bloch[24, May 10; 132, Nov.] ichthyol is superior to the nitrate of silver, creolin, and carbolic acid in the treatment of various inflammatory disorders of the female genitalia. He affirms that the drug exercises a specific action on the diseased mucous membrane, while it does not produce any local or general irritation nor toxic effects. It diminishes both vaginal and uterine discharges, and is of most decided value in metritis of the cervix, in cervical erosions, and in acute inflammations, whether blennorrhagic, or otherwise. The best preparation for injections is a 10-per-cent. solution of the drug in glycerin. In a carefully prepared article Ed. Égasse[67, July 30, Aug. 15] reviews the literature of this drug, especially in regard to its therapeutic uses. It is recommended by Robert Bell[586, Nov. 19, '90; 147, Nov.] as a resolvent in chronic affections of the ovaries, tubes, cellular tissue of pelvis, and even in hæmatocele. A glycerole of ichthyol mixed with boric acid, 10 to 100, is employed. A tampon saturated with the mixture is placed in the vagina, and may be kept there for three days. The therapeutic uses of the ichthyolates of ammonium, sodium, lithium, and zinc are carefully reviewed by Gillet de Grandmont,[471, Dec., '90; 112, Mar.] who concludes that these salts can be advantageously employed both externally and internally. On the whole, the drug has been found to be a powerful antiphlogistic remedy, having been employed with success in the treatment of vesical catarrh, chronic blennorrhagia, spermatorrhœa, pyonephritis, uterine affections, and Bright's disease. The author reports an especial case of rheumatic iritis, with albuminuria, in which the internal use of the ichthyolate of ammonium checked the elimination of albumen. This latter salt may be given in daily doses of from 3 to 7½ grains (0.19 to 0.48 gramme) for children, and from 15 to 60 grains (0.97 to 3.89 grammes) for adults. For external application 10-per-cent. watery solutions or ointments of 25 to 30 per cent. may be employed.

Indigo.—Jones[182, Sept.] has reported success with the use of indigo as an emmenagogue in 13 out of 14 cases. The failure in the one instance was afterward found to be due to the fact that the patient was pregnant. He asserts that during the administration of the drug the os uteri becomes soft and patulous, so much so that the index-finger can be easily introduced.

Iodides.—According to the experience of Ehrmann,[6, May], small doses of potassium iodide are capable of producing symptoms resembling those of marked trigeminal neuralgia. One case is cited in which 15 grains (0.97 gramme) produced marked pain in the forehead, odontalgia, and sensitiveness over the whole distribution of the trifacial nerve. In another patient 30 grains (1.94 grammes) produced pain in the region of the upper jaw, with localized pain and tenderness in the separate branches of the fifth nerve, with œdema of the eyelids on the left side. Two other cases are cited in which similar doses produced like effects. Besides the above-described symptoms there were added in each case lachrymation and injection into the conjunctiva. These cases are of interest, as any untoward effects from such a well-known drug as potassium iodide should be well studied. K. L. Jatzüta[2005, No. 12, '90; 90, Feb.] finds that the absorptive power of potassium iodide and sodium salicylate diminishes as the age of the patient advances, and that this is probably due to the different condition of the vascular system existing at different ages. The following table is of interest:—

Number of Cases.	Age.	Time of the First Appearance in the Saliva.	Average Figure.	Time of the First Appearance in the Urine.	Average Figure.
21	8 to 10 years.	From 6 to 12 minutes.	9.1	From 16 to 22 minutes.	19.7
9	11 to 15 "	" 8 to 12 "	10.0	" 16 to 25 "	21.0
19	16 to 20 "	" 6 to 14 "	10.7	" 19 to 31 "	24.3
10	25 to 40 "	" 8 to 16 "	13.0	" 19 to 31 "	27.7
17	56 to 87 "	" 12 to 18 "	14.5	" 25 to 40 "	32.5
76	. . . . . .	" 6 to 18 "	11.3	" 16 to 40 "	24.9

It will thus be seen that potassium iodide appears in the saliva nearly twice as quickly as in the urine.

Semen N. Zenenko[2 Sep., Aug. 1] praises the treatment of diphtheria by means of the iodide of potassium, the dose for an adult being 5 to 8 grains (0.32 to 0.52 gramme) every two, three, or four hours, and for children from 1 to 14 years of age from ½ to 3 grains (0.032 to 0.19 gramme). This method was employed in 28 consecutive cases of unmistakable diphtheria, in all of which there was a complete recovery. The administration should be continued until iodism appeared and the separation of false membrane began, which is usually on the second, third, or fourth day. Local applications were made to the throat, while the gray mercurial ointment was used for enlarged cervical and submaxillary glands, and stimulants and quinine were employed internally. G. Sée[31 July 2] finds that iodide of potassium dilates the vessels somewhat more than does digitaline, and increases considerably the peripheral circulation, as well as the circulation of the arteries which supply nourishment to the heart.

Iodine.—The combination of iodine with glucose is highly recommended by F. P. Mann,[80 Aug.] who affirms that such combination has produced remarkable results in cases in which the iodide of potassium and even the syrup of the iodide of iron had signally failed. The following formula is given by the author:—

℞ Iodine,	½ drachm	(1.94 grammes).
Iodide of potassium,	2½ drachms	(5.83 grammes).
Pure water,	4 ounces	(120.00 grammes).
Fuscus syrup,	12 ounces	(450.00 grammes).
Essence of gaultheria,	2 drachms	(7.78 grammes).

A tablespoonful of this mixture, in water, is to be taken between each meal.

The author adds that no simple syrup should be used, and that the preparation is to be kept for twenty-four hours before using, as from six to eight hours are required to get rid of the free iodine evolved. J. A. Muenich[186 Aug.] reports the case of a patient suffering from goitre, who took by mistake a teaspoonful of the tincture of iodine. The patient felt better on that day than on any day of her illness. The author regrets that he did not follow up the case with large doses of the tincture of iodine. The patient died a week or two afterward from the effects of the goitre. Tikhon von Popoff[2 Sep., Aug. 1] has used irrigations of iodine-water, of the strength of 1 to 10,000, for the treatment of wounds, this to be followed by the application of either pure aristol or a mixture of 1 part of aristol to 4 of boracic acid. Under such treatment luxuriant and profusely-bleeding granulations quickly returned to their normal appearance. The iodine-water is also stated to quickly check the parenchymatous bleeding from recent wounds.

Iodoantifebrin.—Münzer$^{88}_{v.14, No.4, 5}$ has studied acetoparaiodalid, prepared by Michael and Norton, by treating a solution of acetanilid in acetic acid with chloride of iodine. Such a preparation is freely soluble in water, and occurs in colorless rhombic plates which are without taste.

Iodoform.—In reviewing the recent literature of iodoform poisoning, Rudolph E. Gerlach$^{9}_{Nov.7}$ publishes 4 new cases that have come under his observation. In 3 of them the chief symptoms were tumefaction of the face, with implication, in 2 of the cases, of both hands and forearms. In all 3 the swelling was urticaria-like. One case exhibited an eczematous eruption on the arms, which was preceded by the swelling; in the third, occurring in the person of the author himself, there was no eruption on the disappearance of the swelling. The fourth case was only characterized by acute dermatitis, with burning pain, the formation of blebs, and a profuse exudation. I. N. Love$^{138}_{Sept.}$ holds that there are so many new remedies superior to iodoform as disinfectants, that the time has come when it should no longer be used. H. W. Frauenthal$^{1}_{July 11}$ cites the remarkable case of a woman who took 2 drachms (7.78 grammes) of the drug at one dose, with no evil results. The only symptoms manifested were severe headache, griping pains in the abdomen, and purging. The taste in the mouth and the odor of the drug in the breath of the patient remained for several days. William Carter$^{187}_{Jan.}$ reports for Macalister a case in which the local application of iodoform gave rise, in ten days, to serious symptoms of poisoning, the most noticeable of these being persistent vomiting and emaciation. On the stoppage of the drug the vomiting disappeared in forty-eight hours, and the patient finally made a good recovery. On the other hand, the same author calls attention to the great value of iodoform, in the form of emulsion injected into the bladder, in the treatment of painful and frequent micturition of fetid urine in cases of chronic cystitis. He reports excellent results in a severe case of this nature, under the following prescription:—

℞ Iodoform, ...	2 drachms	(7.78 grammes).
Glycerin, ...	2 drachms	(9.72 grammes).
Mucilage of acacia, . . .	4 drachms	(15.55 grammes).
Water, . .	enough to make 4 ounces	(120.00 grammes).

Three drachms (11.25 grammes) of this mixture were injected at a time.

Iodophenacetin.—This new derivative of phenacetin is said by Scholvein[1000 June 10; 80 Aug.] to possess marked powers as a bactericide, and when given internally may produce, even in small doses, iodine poisoning. When injected hypodermatically, it causes great local irritation.

Iodopyrin.—This substance, obtained by the action of chloriodine upon antipyrin, has been employed by Münzer[88 Nos. 4,5] in the treatment of typhoid fever and phthisis. Its effects, according to the author, are similar to those of antipyrin. It is given in doses of from 7 to 22 grains (0.45 to 1.43 grammes).

Iron.—Attention is called by J. Kersch[560 Mar. 1; 90 May] to the hæmostatic properties of a new preparation of iron, the iron-quinine chloride. It is made by adding an equivalent weight of pure quinine to a solution containing an equivalent weight of ferric chloride. The new substance formed occurs as an amorphous powder, freely soluble in water and alcohol, and should be kept in closed vessels to prevent absorption of moisture. The author says that the drug is exceedingly useful in cases of post-abortum hæmorrhages, in doses of 10 drops, every one or two hours, of a 10-per-cent. solution. It is likewise of value, according to the same authority, in cases of pulmonary hæmorrhage, and in profuse menstruation, in doses of 10 drops five or six times a day. Hugh Woods[2 May 28] recommends the double sulphate of iron and magnesium in the treatment of anæmia or chlorosis, in doses of 10 grains (0.65 gramme) three times a day. He has used with success the following prescription:—

℞ Sulphate of iron and magnesium, .	2 drachms	(7.78 grammes).
Chloroform-water,	enough to make 6 ounces	(192.00 grammes).

Sig.: Half an ounce (15 grammes) three times a day.

The ferrocyanide of iron, or Prussian blue, is said, by W. R. Schussler,[192 Aug.] to possess excellent antiperiodic properties. Several cases are reported in which the drug acted with certainty when quinine failed. No disagreeable effects were observed. It was administered generally in 5-grain (0.32 gramme) doses every three hours. The remedy is likewise recommended by the author as a good tonic. Adolph Tscheppe[28 May] criticises the albuminate of iron and its preparations, especially the albuminate of iron and manganese so exalted by French practitioners, by saying that such preparations are no less nor more valuable than the tincture of the perchloride. Rosenthal,[26 Sept.] after a series of trials, has come to the conclusion that iron, hypodermatically injected, is effective in nervous affections. He recommends especially two preparations: One is the so-called peptonized iron, a brownish-yellow powder, soluble in water. A solution of this is made of the strength of 1 to 10. The second preparation is ferrum oleatum, diluted in the proportion of 1 to 20 of olive-oil. Both preparations are employed in doses of 1 syringeful every second day. The author especially recommends the subcutaneous iron treatment in neurasthenic persons and in asthenic dyspepsia often associated with anæmia. No disagreeable after-effects followed these injections. Hecquet[80 Feb.] has treated 25 cases of spermatorrhœa with ferric bromide. Of this number 19 were completely cured, 2 only being unrelieved. This drug was also frequently found useful in cases of anæmia, leucorrhœa, hysteria, amenorrhœa, hydræmia of pregnancy, chorea, epilepsy, diabetes, and tuberculosis. The dose is 3 to 5 grains (0.19 to 0.32 gramme), given either in solution or in the form of a lozenge. The ferric bromide is to be preferred to the corresponding ferrous compound.

Jatrophia Stimulosus.—The common name of bull-nettle is given to the *Jatrophia stimulosus*, which is said by W. W. Pugh[86 Aug.] to be an excellent antisyphilitic remedy. He uses a tincture of the root in doses of from 20 to 30 drops three times a day.

Jequirity.—This drug has been successfully employed by L. Oren O'Neal[186 Mar.] in the treatment of granulated lids. The author prepares a solution of the drug by placing from 4 to 6 beans in an ounce (30 grammes) of water, and allowing it to stand for twenty-four hours, after which it is filtered. Of this solution 1 or 2 drops are instilled into the eyes twice a day. This is followed by acute inflammation and suppuration. When suppuration ceases the solution is substituted by one of zinc sulphate, 5 grains (0.30 gramme) to the ounce (30 grammes). In about fifteen days the granulations disappear and the cornea becomes clear.

Kava-kava.—Forty-one cases treated with this medicament are reported by David Cerna $^{19}_{\text{May, 2}}$; all more or less illustrate its favorable action on the mucous membrane of the genito-urinary tract. The cases cured, 33 in number, comprised acute and chronic cystitis, gonorrhœa, gleet, vaginitis, retention and incontinence of urine, and dropsy.

Kola.—Chambard Hénon $^{211}_{\text{Mar.15}}$ used, with favorable results, a number of chocolate tablets of kola-nut in the treatment of a woman who, at three confinements, had suffered from alarming syncope and cardiac palpitation.

Lactose.—G. Sée $^{31}_{\text{July 2}}$ finds that lactose, like caffeine, possesses marked renal diuretic properties, and that by its use there is no disturbance of the heart or vessels.

Lime-water.—W. D. Blatchley $^{82}_{\text{Jan.17}}$ believes that lime-water is the active ingredient in the black-wash used by J. A. Kite in the treatment of rhus poisoning. Blatchley asserts that, in his own case, the bathing of exposed surfaces with lime-water prevented the development of ivy poisoning.

Lobelia.—A species of lobelia, the *L. laxiflora*, is used extensively in Mexico, where it bears different Aztec names, such as *Chilpanxochitl*, *Acaxochitl*, and *Pipilolxochitl*, or "hanging-flower." According to F. Altamirano $^{792}_{\text{Apr.;}}{}^{673}_{\text{Sept.}}$ it is preferable to apomorphia and ipecac, since it does not excite the motor nerves, as does the first, nor cause collapse, as does the second. (Report of Semeleder, corresponding editor, Mexico.)

Lysol.—The superiority of this disinfectant over carbolic acid and creolin is claimed by Val. Gerlach. $^{157}_{\text{Nov.}}$ As compared with other powerful antiseptics, it is the least dangerous. To disinfect the hands, 1-per-cent. solution can be used.

Leon Szuman $^{783}_{\text{June}}$ has employed lysol successfully in the irrigation of suppurating wounds, and recommends its use in the disinfection and cleansing of surgical wounds in tubercular bones, in joints, glands, etc., also for washing out the pleural cavities in empyema, or the peritoneal cavity in tubercular peritonitis. The best results are obtained from the employment of 5-per-cent. solutions. For other purposes 1-per-cent. solutions are sufficiently serviceable.

A careful study of lysol has led Michelsen $^{317}_{\text{No.1}}$ to consider it highly serviceable as an antiseptic and germicide, superior even to creolin and carbolic acid. He believes that it is of especial value in gynæcological practice, owing to its lubricating effects, although by its use the instruments are made slippery and difficult to handle.

Magnesia.—The old preparation known as the fluid magnesia of Murray is again referred to[22, Aug.16] as being an excellent laxative and antacid. It is especially recommended for the purpose of recuperating the digestive functions after a carouse. It has the advantage of being unalterable in taste and therapeutic effect.

Magnesium Sulphate.—See Epsom Salts.

Manganese.—H. S. Jacques[281, Sept.] reviews the subject of manganese regarding its chief therapeutic applications. It appears that the drug acts favorably in a variety of disorders, owing to the large proportion of active oxygen present in the several salts employed. It has done good in flatulence, preventing calculi in the uric-acid diathesis, erysipelas, puerperal fever, septicæmia, and bites of venomous reptiles. It has been of especial value in the second stage of gonorrhœa and in the treatment of amenorrhœa. The author regards the drug as especially valuable as an emmenagogue.

Menthol.—John J. Berry[663, May] speaks highly of menthol as a sedative, and recommends its use in the treatment of gastralgia, nervous dyspepsia, and some forms of acute indigestion. In certain forms of neuralgic headache it has been effective in 10-grain (0.65 gramme) doses, administered in hot whisky. The same author has observed good effects following its use as a local application in skin diseases, and similarly, in the form of inhalations, in chronic catarrh of the naso-pharynx, in acute and chronic laryngitis, in laryngeal cough of phthisical patients, etc.; and, finally, the author considers the drug of great utility as an alterative, antiphlogistic, and antiseptic. Lennox Browne[2, Aug.1] has found menthol of use in hay fever. He prefers to combine it with ammonia, or to use it as a smelling-salt. As a spray, it can be employed in the strength of 30 grains (1 gramme) to the ounce (37 grammes) of liquid vaselin. As a snuff, 10 to 15 grains (0.65 to 0.97 gramme) can be used in sugar of milk.

Mercury.—Jendrássik[328, B.10,H.7; 2, Feb.28] again calls attention to the diuretic action of all the mercurial preparations, especially calomel. He affirms that he has seen the amount of urine increase, under the action of the latter salt, from a few ounces to 250 and even 370 ounces (7500 to 11,100 grammes). The author reports the following interesting and instructive case, occurring in a patient suffering from aortic disease, with albumen, tube-casts, and blood in the urine: October 18th, urine 13 ounces (390 grammes); 19th, urine 30 ounces (900 grammes); 3 grains (0.19 gramme) of calomel were then given four times a day; 20th, urine 30 ounces (900 grammes), and 3 grains (0.19 gramme) five times a day of calomel, which, in spite of opium, produced diarrhœa; 21st, urine 25 ounces (750 grammes); calomel, 3 grains (0.19 gramme) four times a day, diarrhœa continuing; 22d, urine 63 ounces (1890 grammes), calomel stopped; 23d, urine 113 ounces (3390 grammes); 24th, urine 82 ounces (2460 grammes), œdema and breathlessness gone; 25th and 26th, urine 40 ounces (1200 grammes). On the whole, mercury acts as a diuretic, especially in cardiac troubles, while it is of little or no use, according to various observers, in dropsies of renal origin, or in hepatic ascites and pleural effusions. E. P. Hurd,$^{80}_{\text{Jan.,Feb.}}$ in a lengthy and well-written article, summarizes the following conclusions: 1. Mercury must still take the palm over all other remedies in the treatment of secondary syphilis. Here the choice is between two evils; but the syphilitic poison is a greater blood-spoiler than mercury, when judiciously administered; and, in antagonizing and destroying the virus of syphilis and preventing its ravages on the blood, mercury becomes a genuine reconstituent tonic. The mercurial treatment is not to be commenced *till the syphilis has declared itself*, and is to be instituted only in the secondary stage. 2. Mercury (under the form of calomel) has no place in medicine as an antiphlogistic or alterative, and its employment, in fractional doses, in combating inflammations, whether acute or chronic, should be absolutely discarded. 3. Calomel has a limited usefulness in infantile therapeutics, but principally as a gastric sedative and as a thorough antiseptic cathartic. 4. Calomel is an efficient purgative, stimulating the secretions of the intestines and liver and promoting intestinal peristalsis; it remains so long unchanged in the alimentary canal that it exercises a local antiseptic and sedative effect, and hence proves valuable in many morbid states of that canal. As a cathartic, it is good to clear the *primæ viæ*, especially when no other cathartic can be borne, owing to irritability of the stomach; in the onset of some inflammatory or febrile diseases it may have a useful depurative and even derivative effect. 5. In ordinary "bilious" complaints calomel has a place entirely subordinate to other more rational and hygienic modes of treatment. In a desperate case of mitral regurgitation, accompanied with great dyspnœa, œdema, constant gastric pain, and scanty urine, in which digitalis had signally failed to give relief, William Carter[187, Jn] reports excellent results from the use of calomel in 10-grain (0.65 gramme) doses at a time, administered on alternate nights. After the second powder, the quantity of urine increased from 10 to 40 ounces (300 to 1200 grammes); after the third, to 60 ounces (1800 grammes), and after the fourth dose to 80 ounces (2400 grammes). All the distressing symptoms disappeared gradually, and in fifteen days the patient was in comparatively good health. W. J. Tyson[2] has noticed that where a series of symptoms would indicate a bilious state of the system, occurring in persons over 40, especially women, and characterized by sleeplessness, he has found the best results produced by the use of blue pill. This acts distinctly as soporific, according to a series of clinical observations of his own.

In those cases of biliary affections, as calculi and catarrhal icterus, and even in hypertrophic cirrhosis of the liver, in which the usual treatment, such as diet, warm baths, and the administration of mineral-water, fails, Zakharine[551, No.1] recommends the use of calomel. The drug diminishes all phenomena of pain. It must be given in doses of 0.05 gramme (⅘ grain) every hour for five consecutive hours, and the same dose continued every two hours until the pain disappears and the temperature returns to normal.

Cochery[6, Aug.29] recommends the use, in syphilis, of the benzoate of mercury, combined with the chloride of sodium, cocaine, and distilled water, and used as an injection. B. Frank Humphreys[19, My] recommends the following combination as a reliable antibilious remedy:—

℞ Calomel, ...	½ gr. (0.032 gramme).
Podophyllin, ...	⅛ gr. (0.008 gramme).
Extract of belladonna, . . .	⅛ gr. (0.008 gramme).
Aloin, ...	⅛ gr. (0.008 gramme).
Oleoresin of capsicum, . . .	1/16 gr. (0.004 gramme).
Ipecacuanha, ...	1/16 gr. (0.004 gramme).

M. and make 1 pill. One pill is to be given as an aperient; 1 or 2 as a laxative; and 3 to 4 as a cathartic and cholagogue.

The author states that each pill weighs 1 grain (0.065 gramme).

Edmund Rundle[2, Feb. 14] speaks favorably of the application of a solution of 1 to 1000 of the bichloride in the treatment of cancrum oris. The acid nitrate of mercury has been employed with success by Hutchinson,[806, Oct.] in the local treatment of nearly all unhealthy-looking sores. He uses the preparation of the British Pharmacopœia, which is a syrupy fluid. The acid should be applied with a brush, and care should be taken not to use too much of the drug, this being easily prevented by means of blotting-paper. Large scars can thus be avoided, especially in cases of acne of the nose. For large ulcers, patches of lupus, and for the tubercles and patches of syphilitic lupus, the acid can be applied more freely; and in these cases it must be left to act upon the part for two or three minutes before the blotting-paper is used. Caution should likewise be exercised with the drug, as indicated, when it is to be applied to the mouth, tongue, cheek, or throat. A. Smakowski[844, Apr. 4] has seen calomel do much good in typhus fever. In two and a half years he has treated 700 cases by every known method. Since he has given up all other treatment but that by calomel, he finds that the course of the disease is shorter and more favorable, and that in many cases, and especially if given in the first week, the disease may be aborted.

Du Castel[3, May 16] reports a case of gonorrhœal rheumatism, in which mercurial friction gave satisfactory results. In another instance, in which the inflammation was more severe, the same treatment did no good. Jullien[3, May 16] recommends very highly subcutaneous injections of the bichloride of mercury for the treatment of this disease.

Bradford Woodbridge[147, Mar.] reports catharsis and mild ptyalism as having followed 2- to 3-grain (0.13 to 0.19 gramme) doses of the yellow subsulphate of mercury (turpeth mineral), which was given to produce vomiting in a child of 3 years. A fatal case of poisoning is reported[673, Mar.] to have occurred in a child from the local application of a solution of the bichloride containing 1 grain (0.065 gramme) in a cupful of water. The boy died in thirty-six hours. The employment of "antiseptic tablets" containing corrosive sublimate is condemned by the writer. Butle[229, May] describes 20 fatal cases produced by the use of corrosive sublimate as an antiseptic. The employment of the bichloride salt is condemned, and it is recommended that the use of the less dangerous compounds, such as salicylic acid, salol, resorcin, and iodoform, be employed in its place. A. C. Abbott $^{761}_{\text{No.18;}}$ $^{90}_{\text{July 22}}$ finds that corrosive sublimate is not as efficient a germicide as is generally supposed. The author studied the influence of the mercurial salt on the staphylococcus pyogenes aureus, and found that the amount of sublimate necessary to prevent the growth of perfectly normal staphylococci was 1 part in 75,000 parts of the ordinary peptone bouillon, or 200,000 parts of bouillon without the peptone. Under the most favorable conditions, the corrosive sublimate has the property of rendering inert only a certain number of individual organisms,—the process being a definite chemical one, and taking place between the protoplasm of the organism and the sublimate in the solution employed. The disinfecting property of the mercurial salt is influenced largely by the proportion of albuminous material contained in the medium in which the bacteria are present, and the relation between the staphylococci and the sublimate is not a constant one. The organisms from different sources and of different ages behaved differently when exposed to the same solution and for the same length of time. Therefore, the solutions of the salt in question do not, as has been and is supposed, possess in the same high degree the disinfecting properties attributed to them by surgeons.

Metamidophenylparamethoxychinolin.—Lépine $^{211}_{\text{Mar.15}}$ speaks of this substance as an analytical compound, claimed by its discoverers to possess therapeutic properties similar to quinine. It is not toxic, and is given in doses of 0.25 to 0.50 gramme ($3\frac{4}{5}$ to $7\frac{3}{4}$ grains). In a case of malaria, in which quinine is said to have failed, 0.25 gramme ($3\frac{4}{5}$ grains) cut short the fever, and there was no return. It was found to be inferior to quinine, especially in 1 case of phthisis and 1 of pneumonia.

Methylacetanilid.—See Exalgin.

Methyl-Blue.—See Aniline.

Milk-Sugar.—To test the diuretic action of milk-sugar Kianowski $^{67}_{\text{Feb.15}}$ has instituted a series of clinical experiments with the drug, in both healthy and cardiac patients. He found that diuresis is not always produced in doses of $1\frac{1}{2}$ to 3 ounces (46.55 to 93 grammes); that no action is exerted on the heart; that the ingestion of the drug frequently causes gastro-intestinal symptoms; that diet has no influence on the diuresis produced, but that a restricted diet is badly borne by patients.

Monesia.—Rozanoff[90, Feb.] considers the now almost forgotten cortex monesiæ (cortex buranham or guaranham) to be a valuable expectorant, owing to the saponine and monesine contained in it, and a good astringent, owing to the large amount of tannin contained in it. The author considers it especially valuable in the co-existing affections of the respiratory and intestinal tracts.

Monobromide of Camphor.—See Camphor Monobromide.

Morning-Glory.—See Pharbitis Trilobæ.

Morphia.—See Opium.

Morrenia Brachystephana.—From this plant, which belongs to the Asclepidaceæ, Pedro N. Arata[952, No.5] has been able to extract two active principles, an alkaloid and a glucoside. This latter substance appears to resemble the glucoside isolated by List from the *Asclepias cyriaca.* The author, who has made a few experiments with a fresh infusion of the root, believes the plant to possess galactagogue properties.

Music.—The value of music as a therapeutic agent has been recognized from time immemorial, and, according to an editorial,[2, Sept.5] it has often been used to soothe "the weariness, the fever, and the fret" of melancholy despair. Canon Harford has recently founded in England the Guild of St. Cecilia, with the object of endeavoring to bring music within the sphere of practical therapeutics. The objects of the Guild are as follow: 1. To test, by trials made in a large number of cases of illness, the power of soft music to induce calmness of mind, alleviation of pain, and sleep. 2. To provide a large number of musicians, specially trained to sing and play the very soft music which should be administered to those whose nerves are weakened by illness. These musicians should be in readiness to answer promptly the summons of a physician. 3. To hire or build, in a central part of London, a large hall in which music shall be given throughout all hours of the day and night; this music to be conveyed by telephone attached to certain wards in each of the chief London hospitals. 4. To obtain opinions and advice respecting the classes of illness in which music is likely to be most beneficial, and to collect and record all reliable accounts respecting permanent benefit that has followed the use of music.

Mustard.—In a very interesting contribution, Pavel M. Gorodtzoff[586, No.23] calls attention to the usefulness of mustard, in the form of sinapisms, for the treatment of troublesome cough. In quite a large number of cases in which the method was employed satisfactory results were obtained. The diseases comprised epidemic influenza, croupous pneumonia, exudative pleurisy, pulmonary tuberculosis, and acute bronchitis. In adults the mustard was mixed with an equal amount of wheat or other meal; in the case of children the combination was 1 part to 3 of the meal. Plasters were placed on the chest and the back, alternately, and were allowed to remain overnight during the twenty-four hours. The remedy was well borne by the patients, and no serious burns were inflicted. On the whole, the author found that in cases of pneumonia, influenza, and acute bronchitis the mustard was an excellent substitute for morphine and other narcotics; that, in those of phthisis and pleurisy, it was a valuable adjuvant, when smaller doses of the narcotic employed were sufficient to produce the desired effect; that, in relieving the cough, the mustard improved the pulse and the respiration, the former becoming fuller and stronger, the latter deeper and less frequent; that the effects of the drug depended on the volatile oil which penetrated into the system through the lungs and the skin; and that, finally, mustard promoted the absorption of the inflammatory effusions of pneumonia and pleurisy.

Naphthalin.—This drug is recommended by Mirovich,[July 6, 11] not only as a good remedy for ascarides, but also for tape-worm. It is less poisonous than most other vermifuges. The drug acted in his hands when other measures had failed, the whole tænia, with its head, being expelled after the first dose. The medicament is administered at one dose of 15 grains (0.97 gramme) for adults, to be followed by 2 ounces (75 grammes) of castor-oil. In children the drug may be mixed with the oil, flavored with bergamot. Before the medicine is taken, it is advised that the patient live on salt, acid, and highly-seasoned food for two days.

Nitrites of Ethyl and Sodium.—Leech, assisted by Jones, Duncan, and Pownall,[July 2, 11] presents a preliminary report on the action of the nitrites of ethyl and sodium in the dyspnœas of various origin; 24 cases are tabulated, relief occurring to a marked extent in a certain number of these, while in others the remedies were of no avail. The ethyl nitrite was administered in a 3-per-cent. solution of absolute alcohol, 1 to 2 drachms (3.89 to 7.78 grammes) of this solution being given. The sodium nitrite was employed in solution in doses of 1 to 3 grains (0.065 to 0.19 gramme). In 1 case as high as 5 grains (0.32 gramme) were administered.

Nitro-Benzol.—The following case of nitro-benzol poisoning, reported by Algernon Hodson,[6 Ap.18] has many features of interest. Several cases have been cited at various times in which nitro-benzol proved fatal in small doses; 1 in particular being referred to by Letheby, in which a fatal issue followed the ingestion of 8 or 9 drops. In the present case recovery took place after a large quantity had been swallowed. The details are as follow: R. E., aged 48, registered chemist, had measured 2 drachms (7.78 grammes) of nitro-benzol to scent some soap, and by some mistake drank it at 1 P.M. on March 11, 1891. He then made a hearty dinner of beefsteak-pie, and felt no ill effects from the poison except tasting and smelling almonds until 2.30. He then became giddy, and was advised to go home. He was able to walk home, a distance of about half a mile, feeling all the time as though intoxicated, being unable to control his legs or see clearly. On reaching home, about 3.15, he informed his daughter that he had taken nitro-benzol by mistake. She went for a doctor, and, in the meantime, the patient became unconscious. Dodd and Philips washed out the stomach and got rid of the contents, consisting of lumps of meat, smelling very strongly of nitro-benzol, as did the breath and the whole atmosphere of the room. A hypodermatic injection of ether was given. He was then sent to the Hove Hospital. Condition on admission at 4.30 P.M.: Strong, well-nourished man, insensible, collapsed, extremely cyanosed, short and irregular breathing. Pulse, hardly perceptible; 60. Pupils contracted, conjunctiva not insensible, no paralysis. Had defecated involuntarily. Stimulants administered and heat to extremities. At 6 P.M. the breathing was quite regular; pulse, 80; still extremely cyanosed; could open his eyes; looked vacantly if shouted at; vomited twice. At 12 A.M. he was in the same condition. Micturated involuntarily. Temperature, 99° F. (37.2° C.). The next day the patient was much better—sensible, but still much cyanosed; thirsty, and complained of stiffness and soreness over the whole body; the pupils still contracted; no headache; pulse, 84; respiration, 18. On the 13th the cyanosis was less marked and the pupils less contracted. Urine drawn off, 36 ounces (1080 grammes),—very dark mahogany colored, perfectly clear, no peculiar odor; specific gravity, 1025. The condition continued to improve and the cyanosis to decrease until the 19th, when the man was discharged cured.

Nitrogen Monoxide.—At a discussion on the subject before the New York Neurological Society, R. L. Parsons, W. M. Leszynsky, W. J. Morton, C. L. Dana, and other practitioners[1 Feb. 7], reported unfavorable results from the use of this remedial agent, the general opinion appearing to be that it was not likely at any time to rank high as a therapeutic agent. W. R. Birdsall[1 Mar. 11] reports unsatisfactory results from the use of nitrous-oxide gas, especially in hypochondriacal and neurasthenic cases. He has treated patients suffering from migraine, persistent headache, paralysis agitans, asthma, chronic bronchitis, insomnia, melancholia, organic cardiac disease, opium habit, alcoholism, and hysteria. He ascribes the failure of the gas to its transient effects and its rapid elimination. The literature of the subject is reviewed by this author, as regards physiological action and therapeutic uses, and, from the data collected, the conclusion is reached that the uses of the gas are restricted, in both medical and surgical cases, to its effects as an anæsthetic and placebo.

Nitro-Glycerin.—According to Béla Bosángi,[81 Oct.] nitro-glycerin has given good results in the treatment of fainting, spasmodic asthma, opium poisoning, anæmic coma, resuscitation of the drowning, and in collapse. It can be used in acute cases, but its action is not very lasting. It produces no disagreeable after-effects, even when administered for a long time. Four highly interesting cases, in which the use of nitro-glycerin gave the happiest results, are reported by John H. Upshur.[81 Feb.] The first case was one of heart-failure, as a result of typhoid fever. The heart had failed to respond even to digitalis, but nitro-glycerin, in doses of $\frac{1}{50}$ grain (0.0013 gramme), every two hours, caused the patient to rally. Strychnia and strophanthus were also used in this instance. The second case was that of serious collapse, due to a most obstinate and uncontrollable diarrhœa. Three of the relapses were controlled by doses of $\frac{1}{50}$ grain (0.0013 gramme) every two hours. The patient, however, finally succumbed; but the fact remains that nitro-glycerin was prompt and efficient in its action. The author believes that for the relief of *muscular spasm, present in renal and hepatic colic*, there is no more powerful remedy than nitro-glycerin, and that the same is true in cases of spasms of the bowels and stomach, whatever their source. He relates a third instance of a woman, 54 years of age, suffering from terrible attacks of spasms of the pylorus. Opiates had failed, but a single dose of $\frac{1}{50}$ grain (0.0013 gramme) of nitro-glycerin caused the pain to completely disappear in a little over two hours. The remedy was ordered to be taken at each succeeding paroxysm, and finally the patient entirely recovered. A fourth case was that of a man afflicted with Bright's disease, to whom the usual treatment had given no relief, and who was placed under nitro-glycerin in doses of $\frac{1}{100}$ grain (0.00065 gramme), three times a day. In ten days the albumen was diminished and the œdema of the lower extremities had entirely disappeared. In two weeks more the patient was able to return to his work. The author believes that the drug acts more promptly when given by the mouth than when administered hypodermatically. Nitro-glycerin has been found serviceable by J. Lindsay Porteous[36, Dec.,'90] in 1-drop doses of 1-per-cent. solution, given every five minutes, in the treatment of asthma, especially during a paroxysm. W. H. Vary[202, Feb.25] praises its action very highly in the treatment of gas asphyxia. He cites 2 cases in which he gave a hypodermatic injection of 10 drops of a 1-per-cent. solution. Amelioration of the symptoms was rapidly manifested. He has also used it in 3 other cases, with success. R. Hoffmann[297, No.18] reports a case of poisoning by illuminating-gas, in which the symptoms consisted of a bluish countenance, cold extremities, foam at the mouth, filiform and intermittent pulse, superficial respiration, and absence of reaction of the cornea when touched. Injections of ether proving of no benefit, the author injected 0.001 gramme ($\frac{1}{64}$ grain) of nitro-glycerin in the precordial region. Improvement manifested itself at once, and the patient promptly recovered.

Nitromuriatic Acid.—H. N. Hall[202, Apr.25] reports that the condition of brass poisoning is most frequent during the spring months, and that it can be readily controlled by nitromuriatic acid. In his capacity as physician to the Crane Iron Works, of Chicago, 48 cases came to him for treatment during the year 1890.

Nux Vomica.—Jonathan Hutchinson[806, Apr.] states that he has had patients who say that they become sick upon the administration of tincture of nux vomica. They are usually the kind of people who read their prescriptions, and with a smattering of knowledge dwell upon the word vomica, fancying that it has something to do with an emetic. W. B. Caley[6, Jan. 18] reports a case in which an overdose of strychnia was taken, consisting of $\frac{5}{16}$ grain (0.02 gramme) of the phosphate of strychnia, given in the form of Easton's syrup. Typical symptoms of strychnia poisoning came on in twenty minutes. Half an ounce (15.5 grammes) of bromide of potassium was given in two divided doses, with prompt amelioration of the symptoms. Gamper[6, Apr. 18] has, in a series of experiments on four healthy individuals, found that strychnine increases the amount of gastric juice secreted, its general acidity, and the quantity of free acid in the secretion. He has found it of great value in the treatment of chronic alcoholism, declaring that in such cases it is the most effective of all drugs.

E. Biernacki[116, No. 4, '90] considers the general belief that strychnine has no influence upon the cerebrum to be ungrounded and improbable. From experiments on rabbits, he is of the opinion that strychnine would be useful as a remedy in irritable conditions of the cerebral cortex. Chazarain[129, Dec., '90] reports the cure of a case of incontinence of urine, of twenty-five years' standing, by the dosimetric use of strychnine. Davenport Parry[267, Mar.] relates a case in which the bite of the death-adder was successfully treated with strychnine. The case was one of a Chinese miner, who was bitten in the foot by the adder at 8 P.M. His friends immediately tied ligatures in several places, and used moistened tobacco on the wound. He was seen nine hours later by Parry, who found the leg enormously swollen, the ligatures appearing to be buried in the limb. The man was comatose, and could not be aroused in order to swallow anything. The ligatures were removed, and 15 minims (0.97 gramme) of the liquor strychniæ of the British Pharmacopœia were injected into the groin on the side of the affected limb. In a few minutes the man began to regain consciousness, as was shown by the fact that he commenced to groan, and was soon able to answer questions. The limb was now rubbed to restore the circulation, when he began to show symptoms of returning stupor, and 10 minims (0.65 gramme) more of the liquor strychniæ were used. This appeared to effectually arouse him, and caused some slight muscular twitchings about the neck. Easton's syrup was ordered, that the strychnine treatment might be continued. In ten days the man was able to return to work.

The case was a severe one, as is shown by the fact that the doctor was sent for in order that the man might not die without a certificate of death. Another case of recovery from the bite of the death-adder is reported by A. Campbell,[267, Mar.] in which an equal amount of liquor strychniæ was used. The patient was bitten in the middle finger of the left hand, a ligature being put on a minute after the accident, and the wound sucked. Some twenty minutes afterward 1 ounce (27 grammes) of whisky was given. He was seen by Campbell forty-five minutes after the accident, and appeared drowsy and inclined to vomit. Pupils rather dilated, but reacting to light. Pulse fast and skin moist. Fifteen minims (0.97 gramme) of the liquor strychniæ, followed in forty minutes by 10 minims (0.65 gramme) more, were injected. The only unpleasant symptom the next morning was a slight tendency to sick headache.

Œnantha Crocata.—F. H. Fisk[192, Nov.] quotes a case of epilepsy, in which he used small doses of the tincture of œnantha crocata, continued for a long time, with most beneficial results. He has also used this medicine in 5 other cases, with like good results.

Oils.—The hypodermatic injections of oil have been used with beneficial results by Besnier.[287, June] According to the author, under this treatment, lupus becomes moderately congested, and the cicatrization of open tuberculous sores is hastened. Besnier, however, reports 2 cases, in which these injections were followed by serious symptoms of poisoning, which were attributed to the creasote with which the oil was mixed. The writer thinks that caution only is required to avoid these untoward phenomena. Generally, the medicated oil is well borne. The doses of the daily injections varied from 50 to 100 grammes (1¾ to 3⅜ ounces). According to A. Vicario,[473, June 16] oily liquids used in hypodermatic injections must be carefully sterilized. In the treatment of phthisis the following formulæ are particularly recommended:—

℞	Guaiacol, ...		5 grammes	(1¼ drachms).
	Iodoform, ...		1 gramme	(15½ grains).
	Olive-oil and liquid vaselin,	q. s. ad	100 c.cm.	(3½ ounces).
℞	Eucalyptol, ...		14 grammes	(8¾ drachms).
	Guaiacol, ...		5 grammes	(1¼ drachms).
	Iodoform, ...		1 gramme	(15½ grains).
	Olive- or almond- oil, .	q. s. ad	100 c.cm.	(3½ ounces).
℞	Eucalyptol, ...		12 grammes	(3 drachms).
	Guaiacol, ...		5 grammes	(1¼ drachms).
	Iodoform, ...		4 grammes	(1 drachm).
	Olive-oil, . . .	q. s. ad	100 c.cm.	(3½ ounces).

Of any of these solutions the dose, for hypodermatic injections, is from 3 cubic centimetres (46 grains) to 12 cubic centimetres (3 drachms) in twenty-four hours. Plain solutions can also be used in olive-oil or almond-oil; in creasote 1 to 15 or eucalyptol 2 or 4 to 10.

Oleum Ricini.—See Castor-Oil.

Opium.—In carefully and intelligently reviewing the literature of the therapeutic uses of codeine, Samuel Nickles[428, Sept.] concludes that this drug is more useful and appropriate than morphine and opiates in all cases requiring a mild narcotic or anodyne influence. In cases of phthisis, especially, it should be preferred to relieve pain, cough, and sleeplessness. The doses may vary from $\frac{1}{6}$ to $\frac{3}{4}$ grain (0.011 gramme to 0.049 gramme). The majority of practitioners prefer the employment of larger quantities, such as $\frac{1}{2}$ grain (0.032 gramme), three times a day. From a series of clinical experiments, Fürst[112, Aug.] believes that the drug, used in moderate quantities, does not injure pregnant women, and that it does not endanger fœtal life to the extent that has been supposed. It is apt to be more dangerous during labor, however, especially if its use is prolonged. The author has observed that in nursing-women, the drug, when given under these circumstances, passes rapidly into the milk. Grimaux[121, July] states that he has been able to convert morphine into codeine, by means of cupreine, a base found in the *Remijia pedunculata.*

Protopin exists in very small quantities in opium. R. V. Engel[273, B.27,H.6] finds that, in small doses, in the frog, protopin acts narcotically, like most of the alkaloids of opium. In large doses, the muscular substance is paralyzed, as well as peripheral nerves. Reflex excitability is preserved after small or moderate doses, and is lost after large doses. The symptoms of poisoning resemble those produced by camphor. Aug. Voisin[67, Apr.15] calls attention to the great value of chlorhydrate of morphia in the treatment of mental and nervous disorders. He publishes 7 illustrative cases in which good results were obtained, and concludes, from his clinical observations, that, owing to its gratifying effects and other advantages, the drug prevents the physician from sending his patients to lunatic asylums. Inhalations of paregoric are recommended[43, Sept.] in chronic laryngitis. In cases of uræmia where dilatation of the pupil is a marked feature, William Carter[187, Jan.] strongly recommends the use of morphine, hypodermatically administered. He reports a case of this character, in which the employment of the drug saved the life of the patient. The alkaloid, he affirms, should *not* be given, however, in those cases where the symptoms resemble those of opium poisoning, and in which the contraction of the pupil and sweating of the skin indicate the approach of a fatal issue. A case of morphine poisoning is published by Norton L. Wilson,[1 Mar. 14] the fatal issue being attributed to the fact that a large amount of the drug was liberated at once from suppositories imperfectly dissolved. In the course of two hours 2 suppositories, containing ½ grain (0.032 gramme) each, were introduced, and, as they produced no effect, in an hour afterward a third suppository was administered, with the fatal result indicated above. The author, with sufficient reason, warns against the use of old morphine suppositories, which, on being repeated, owing to their inability to produce the effects required, may give rise to serious poisoning.

Orexin.—Five cases of tubercular disease, in which anorexia was a prominent symptom, are reported by John Gordon[6 July 11] as having been benefited by the use of this drug. The writer believes that in such cases the drug acts as a valuable stimulant, enhancing the absorption of the products of digestion and relieving constipation. M. Matthes,[26 July] reports 27 cases of anorexia from various causes, in 16 of which orexin was especially effective. He believes that the drug stimulates principally the secretion of hydrochloric acid, and that it, therefore, fails in atrophic diseases of the gastric mucous membrane, and does not give good results in cases of cachexia, with a predisposition to amyloid degeneration. Of 250 cases treated by Kronfeld[26 July] with orexin, successful results were obtained in 160. W. Brunner[520 Mar. 14; 673 Aug.] made 180 separate observations in 30 different persons treated with orexin. In 4 healthy individuals the drug produced pain and vomiting. Of 26 patients suffering from anorexia, only 6 were slightly improved, and in 6 it had no effect whatever. In 10 cases, affected with phthisis, rheumatism, and cardiac disease, the effects of the drug were doubtful. Finally, in the 4 remaining, of which 1 was a case of acid gastric catarrh, 2 of gastric cancer, and 1 of gastric dilatation, the symptoms, such as pain and vomiting, were aggravated. The author, therefore, condemns orexin as a useless drug.

Oxalic Acid.—A. W. Marsh[80, Mar.] claims to have obtained good results from the use of oxalic acid in amenorrhœa. He calls especial attention to the value of the drug as a sedative in acute cystitis, and publishes 4 interesting cases to show this remarkable action of the acid. The author believes that cases of acute cystitis, from whatever cause, can be entirely subdued by this remedy. He has used the following prescription:—

℞ Oxalic acid, ...		16 grains (1.04 grammes).
Syrup of orange, ...		1 ounce (37.00 grammes).
Distilled water, . .	q. s. for	4 ounces (120.00 grammes).

Of this mixture a teaspoonful every hour is to be given until relief is obtained.

Oxygen.—Subcutaneous injections of nascent oxygen are advised by Valenzuela[82, Aug.1] in all cases of imperfect aëration of blood, especially in the bronchitis and pneumonia of aged persons. The injections can also be administered through the rectum. The gas is said to relieve the dyspnœa very promptly. Robert A. Reid,[547, Apr.] states that the power of the agent is confined to two classes of disorders, namely, those depending on defective nutrition and those due to defective respiration. In the first class phthisis stands prominent. In the early stage of this affection, the administration of the gas, with the usual tonic and supporting treatment, is often followed by recovery; in later periods the remedy causes amelioration of the symptoms, diminishes cough and temperature, breaks up the night-sweats, and frequently causes increase of weight and improvement in the general health of the patient. In the second class of cases, it is of especial value in all those disorders in which dyspnœa is a prominent symptom. Thus, in asthma, oxygen is said to act almost as a specific. Flattering success has been obtained in cases of emphysema, croup, diphtheria, the venous congestion and dyspnœa of acute pneumonia, and even in opium poisoning. The quantity of the gas administered should be governed by the exigencies of the individual case; thus, for instance, in chronic disorders associated with anæmia, beneficial results may be obtained from the ingestion of from 2 to 4 gallons (8 to 16 litres) three times a day.

Excellent results have been obtained by J. H. de Wolf[196, Jan.] from the administration of the gas in cases of asthma and tobacco-heart. The writer states that oxygen dissipates congestive headaches, and that it also acts as a heart-tonic. He has seen prompt relief follow the administration of the gas in phlyctenular conjunctivitis associated with debilitated conditions, often with scrofula. A case of severe headache is reported, occurring in a man, in which, after the bromides and opium had failed, a single inhalation of oxygen was sufficient to effect a cure. The headache, after four months, had not returned.

Especial reference is made, in an editorial,[22, June 8] to a remarkable case, in which a man had been apparently killed by inhaling coal-gas. When found, there was no action of the heart nor any perceptible breathing; however, the administration of oxygen by the mouth, in inhalation, was followed almost immediately by the happiest results. Charles R. Francis[22, June 17] reports a most interesting case of approaching dissolution, due to an attack of diphtheritic sore throat, in which the exclusive administration of the gas saved the patient's life. A. Mary[46, May 30] has employed oxygen with success for the relief of asphyxia from whatever cause, and also in affections such as asthma, emphysema, whooping-cough, dyspnœa, and the vomiting of phthisis. The inhalations of the gas were also efficacious in chlorosis and sympathetic anæmias, and in controlling the vomiting of dyspeptics, consumptives, etc.; but the author found that it did little or no good in cardiac and aortic disease. Mary also recommends oxygenated water as an antiseptic.

Ozone.—Samuel S. Wallian,[1, July 25] from the results of well-recorded observations, finds that ozone is particularly useful in cases in which weak sexual power is a prominent symptom. Even sterility is said to disappear under its use,—a fact which, if true, is of the greatest practical importance.

Pambotano.—Pambotano, or *Calliandra houstoni*, is a small tree found principally in Mexico, and growing from three to five feet in height. In that country it has a considerable reputation for its medicinal qualities. It was brought to the notice of French physicians, in 1889, by J. Valude, who uses a decoction and alcoholic elixir, in doses of 70 grammes ($2\frac{3}{8}$ ounces) for an adult and 35 grammes ($1\frac{3}{16}$ ounces) for children under 12 years of age. A. E. Roussel[144, Aug.] has used pambotano in 8 cases of malarial fever, with encouraging results, but hardly as satisfactory as some of the reports from abroad. J. Pelletan[164, Apr. 30] records the case of a patient, aged 38 years, who had been exposed to various forms of intermittent and remittent fever, and had suffered from various forms of neuralgia. Quinine proving of no avail, he administered pambotano, and for three months the patient has suffered no facial, intercostal, nor sciatic pain.

Paraffin.—The following combination of paraffin and lanolin is said by Paschkis$^{45,\ 673}_{\text{H.1; May}}$ to possess especial advantages:—

℞	**Lanolin,**	**66 parts.**
	Liquid paraffin,	**66 parts.**
	Ceresin,	**1 part.**
	Distilled water,	**65 parts.**

Parsley.—R. H. Hill$^{139}_{\text{June}}$ considers apioline to be especially indicated in spasmodic and congestive dysmenorrhœa. The dose used was 3 minims (0.18 gramme), given in capsules, three times a day.

Penghawar Djambi.—Chappet$^{211}_{\text{Nov.30,'90}}$ showed, at a meeting of the Société Nationale de Médecine de Lyon, two vegetable products,—penghawar djambi and pakoe kidang,—which are used in Java as hæmostatics.

Peroxide of Hydrogen.—See Hydrogen Peroxide.

Petrolatum.—John Aulde$^{99}_{\text{July 9}}$ states that the workmen who prepare the crude petroleum, when they have a bad cold, fill the nostrils with cosmolin, and the trouble quickly passes away.

Pharbitis Trilobæ (Morning-Glory).—Y. Inoko$^{200}_{\text{Aug.31}}$ confirms the experiments of K. Hirano, that the resin found in the seeds of the morning-glory is identical with convolvuline. There is also present with the resin a neutral fat. From physiological experiments, the author considers that this resin might be employed in the place of jalap, senna, etc. The dose should be 0.5 to 0.7 gramme (7¾ to 10¾ grains), in the form of pills, or preferably in the form of an emulsion. One of the advantages would be its inexpensiveness.

Phenacetin.—Sinforiano Garcia y Mansilla$^{357}_{\text{Sept.15}}$ has carefully studied phenacetin in neuralgia, phthisis, muscular rheumatism, typhus fever, malarial fever, pneumonia, pleurisy, erysipelas, etc. His results show (1) that when therapeutic doses are used the physiological temperature in man is not lowered. 2. In warm-blooded animals the temperature is lowered by the use of 1 gramme (15½ grains) per kilogramme (2¼ pounds) weight. Phenacetin had no influence upon cold-blooded animals. 3. Phenacetin is a powerful antipyretic in various diseases. 4. Fever begins to lessen half an hour after the taking of the drug in therapeutic doses, reaching its maximum in four hours; later on, the temperature rises to the same height as before. Phenacetin in the usual doses does not produce poisonous effects, while in animals 2 grammes (31 grains) to the kilo (2¼ pounds) of body-weight causes symptoms of poisoning. 5. In acute muscular rheumatism this medicine is as nearly as possible a specific, as it lowers the fever and diminishes the pains. 6. It diminishes the secretion of urine in polyuria of a neurotic origin. M. F. Osborne[760, Nov. 7] combines phenacetin and sulphonal, in order to obtain a good hypnotic action. Wm. A. Jack[138, July] considers phenacetin the ideal antipyretic. Reuter[953, Mar. 21, '90; 90, June] finds that at times it contains some unconverted paraphenetidin, and that this latter substance possesses, in very small doses, poisonous properties, causing nephritis with albuminuria. A method of testing for this substance in phenacetin is given as follows: 2.5 grammes (38¾ grains) of chloral hydrate are melted in a small test-tube on a water-bath, and 0.5 gramme (7¾ grains) of phenacetin added. Upon shaking a solution will be formed, and if the phenacetin be absolutely pure the solution will remain colorless for at least five minutes, but after that time will assume a rose-red color. If, however, the paraphenetidin be present, and it be exposed to the same temperature on a water-bath for not more than two or three minutes, the solution becomes colored, according to the quantity of contamination present, into a more or less intensely violet, varying from a red violet to a blue violet.

M. B. Herman[74, May] has entirely discarded the older antipyretics for phenacetin. He has had good results with this drug, in combination with small doses of quinine, in the treatment of malarial fever. The advantages claimed are that it is less toxic; that it seldom, if ever, produces cyanosis, collapse, or rigor; that it does not produce nausea or vomiting, nor the scarlatiniform rash of antipyrin; that it is tasteless; that the administration is unaccompanied with unpleasant after-effects; that it requires two-thirds less than antipyrin to obtain the same effect, and that it is cheaper, being unprotected by patent. Neill MacGillycuddy[2, July 26] adds his testimony to the value of phenacetin as an analgesic and antipyretic. Arthur C. Davidson[760, Apr. 26] is fully satisfied that it is the safest and best of the new antipyretics. Two years ago it was pointed out that phenacetin would probably be adulterated with acetanilid, on account of the resemblance of their physical and chemical aspects. A case in Elberfeld, which exhibited toxic symptoms, proved, on investigation,[6 Dec. 20,'90] that the phenacetin supplied consisted of equal parts of this substance and of acetanilid.

Phenidin.—Phenidin is para-acetphenetidin, and is closely allied to the better-known phenacetin. Depasse[112 July] believes it to be equal, if not superior, to antipyrin as an analgesic. The dose is 15 grains (0.97 gramme) given hourly until four doses have been taken. It has been used with success in sciatica, lumbago, migraine, and even in the pains of metritis and perimetritis.

Phenocollum Hydrochloricum.—Hertel[69 Apr. 9] states that phenocollum hydrochloricum is a white crystalline powder derived from phenacetin. This salt is soluble in about 16 parts of water at 17° C. (62.5° F.), and gives a neutral reaction. Hertel finds that phenocoll hydrochlorate has some value in the pyrexia of phthisis, and upon the pain and fever of acute rheumatism. No bad effects were noted upon the kidneys, but after the administration of 75 grains (4.83 grammes) the urine exhibited a brown-red to a deep, blackish-brown discoloration, which became of a dark color on exposure. It was deepened also by the addition of the chloride of iron. The elimination seemed to be completed in twelve hours. In doses of 15 grains (0.97 gramme) it is said[69 Apr. 9] to reduce the temperature to the same extent as antipyrin and phenacetin in doses of from 20 to 30 grains (1.3 to 1.94 grammes) of the former and about 15 grains (0.97 gramme) of the latter. In quantities of from 7 (0.45 gramme) to 15 grains (0.97 gramme) phenocoll also produces analgesia. Benno Herzog[69 July 30] has used phenocollum hydrochloricum in 17 cases,—as an antipyretic in 11 cases and as an antineuralgic and antirheumatic in the remaining 6. Careful tracings are given of the temperature and pulse. His conclusions are that the medicine, when given either inwardly or by subcutaneous injection, produces no unfavorable symptoms such as malaise, vomiting, pain in the stomach, diarrhœa, etc. The dose is best disguised by administering it in capsules. In 1 case, with a 1-gramme (15½ grains) dose, there were symptoms of cyanosis and heart weakness. It lessened the pains of rheumatism and neuralgia. In the dark-colored urine, spoken of by Hertel, no albumen was discovered. In certain cases, indican, but never urobilin, was found. The sweating in 2 cases of phthisis could be controlled, when it was used as an antipyretic, by the administration of small doses of atropine. Herzog believes that this drug will take a lasting place in medicine.

Phosphorus—Phosphoric Acid.—The process employed[80 Feb.] in making a solution of phosphorus in retinol is as follows: Moisture is first driven off by heating the retinol to 100° C. (212° F.). It is then introduced into a dry vial and allowed to cool, when 1 per cent. of dry transparent phosphorus is dropped into the liquid. Gentle heating and shaking are now all that are necessary to obtain a complete solution. Hugo Schultz[176 Aug.] finds that, contrary to the general supposition, phosphoric acid increases the frequency of the pulse instead of decreasing it. His experiments were made upon healthy students, who, with the exception of one, did not know what acid they were taking. Bat Smith[143 Aug.] reports 3 cases in which pure phosphorus was used in the treatment of diseases of the nervous system. In one case of epilepsy, due to sun-stroke, $\frac{1}{20}$ grain (0.0032 gramme) of pure phosphorus, three times daily, stopped the seizures, and there has been no return for three years. P. Vigier[3 Feb.4] believes, from a number of experiments on animals, that turpentine is useless as an antidote for phosphorus. It is a well-known fact that different varieties of turpentine exist, and that what is usually called the French variety is considered, in this country, a good antidote for phosphorus; but it is interesting to note that even some French observers do not approve of the use of turpentine in phosphorus poisoning.

Phytolacca Acinosa.—K. Kashimura[200 Apr.25] has used a decoction of *Phytolacca acinosa* with good results in the treatment of dropsy. The poisonous element of the plant has lately been discovered by C. Nagai, and is found to be an amorphous resin. The reason why certain authorities have not obtained satisfactory results with it is probably due to the fact that the diuretic effect is not prompt, but comes on four or five days, or even later, after the use of the drug. William B. Bigler,[760 Aug.8] learning that abscess of the udder in cows was treated with poke-root, tried it upon a case of mammary abscess in a woman. The patient was terribly nauseated, vomiting considerably, but the abscess was cured. It was given internally in 10-drop doses of the fluid extract three times a day.

Piñoncillo.—*Jatropha curcas,*[237 Jan.] commonly called in Mexico piñoncillo, or piñon de Indias, is said to possess drastic properties. For purging, the oil is employed in doses of 2 to 8 drops. In cases of poisoning by this drug Grosourdi recommends the free administration of wine and brandy. (Report of Semeleder, corresponding editor, Mexico.)

Piperazidine.—Vogt[8, Feb. 4] has taken piperazidine internally, and finds that, while the quantity of urea excreted augments, the uric acid diminishes to a noticeable extent.

Piperazin.—Ebstein and Sprague[4, Nov. 14] had studied piperazin as a solvent for uric acid. Its use was not extended enough to make any more definite statement than that it is well borne by the patient, and deserves further trial.

Piscidia Erytherina—Jamaica Dogwood.—M. E. de Laval[221, July] thinks that there are in *Piscidia erytherina* valuable therapeutic properties. Especially is the employment of this drug indicated in the treatment of certain affections where opium for one reason or another is contra-indicated, and especially in cases where the latter causes irritation of the nervous centres. Its advantage over opium is that there is no danger of creating a habit; neither is there a suspension of the secretions of the skin or other organs. A woman suffering from uterine cancer was not able to bear opium or its alkaloids in any form. Trying hyoscine with no avail, de Laval employed piscidia. The nervous irritation was lessened, constipation was diminished, and the pains were so relieved that the patient was able to rest at night.

Polygonum.—John W. Eckfeldt[121, June] states that we have, in many of the species of polygona, valuable emmenagogues. Of these, *Polygonum hydropiperoides* and *Polygonum punctatum* are considered the best. A fluid extract is made, and given in doses of from 15 to 30 minims (0.90 to 1.87 grammes), two or three times a day. It is stated that polygonum steeped with baptisia tinctoria was used in the Southern States, during the time of slavery, for the purpose of producing abortion.

Potash.—Rossander[6, Aug. 20] has treated 4 cases of epithelioma by injections of caustic potash in the neighborhood of the tumor. The patients are said to have been entirely cured.

Potassium Bromide.—See Bromides.

Potassium Iodides.—See Iodides.

Primula Obconica.—S. A. L. Swan[6, Apr. 25] reports 2 cases of poisoning from the *Primula obconica.* This plant is a favorite in the hot-house, on account of its pretty flowers and foliage. The irritation might easily be mistaken for acute eczema or erysipelas. In 1 case in which the right hand was much swollen and inflamed, the patient—a lady—complained of itching and burning pain in the fingers.

Protopin.—See Opium.

Pyoktanin.—See Anilin.

Pyrazol.—H. Tappeiner[273; B.23,H.3,4] finds that phenylmethylpyrazolcarbonic acid produces its diuretic action upon man and animals by a direct action upon the kidneys. It was used in doses of 1 to 2 grammes (15½ to 31 grains), vomiting and other unpleasant effects not being produced by this dose. Although this acid has a very similar composition to that of antipyrin, it does not possess any antipyretic action.

Pyrodin.—Paul Simon[184; Nov.15,'90] has carefully studied the thermic action of pyrodin, and finds that usually in ten to fifteen minutes after the administration of the drug the temperature commences to fall. Arriving at its minimum it sometimes rises immediately, but oftener the lowered temperature remains stationary for hours, after which re-ascension takes place. The duration of the antipyretic action is relatively long, lasting from six to ten hours, and at times even longer than this. It would thus seem that the antipyretic action of pyrodin is more rapid and prolonged than other similar drugs. As an analgesic, it acts in half an hour in lessening the pains, whether neuralgic or rheumatic. Unfortunately, on account of the fact that the corpuscles of the blood are altered after several days' use, it cannot be employed for any length of time, even in very small doses.

Quebracho.—J. A. French[856; May] praises the use of quebracho in dyspnœa, whether associated with emphysema of the lungs, atheroma of the arteries, or degeneration of the cardiac muscles.

Quinine.—Irakly M. Bünin[2005, 90; No.67; July] has studied the action of the sulphate and hydrochlorate of quinine on the gastric digestion of 11 healthy persons, ranging in age from 21 to 23 years. From these experiments he decides that 0.62 gramme (91½ grains) of the hydrochloride does not retard gastric digestion, while the sulphate retards the earlier stages. Both of these salts in this amount increase the acidity of the gastric juice and the absorptive power of the stomach. The process of peptonization of proteids and the energy of the rennet ferment is not affected. One-half of this amount exerted a similar action upon the gastric function, though the effects were less constant and pronounced. Hydrochlorate of quinine is preferable to the sulphate, as it is more simple, more easily absorbed, and interferes with digestion to a less degree than the sulphate. The addition of hydrochloric acid to the aqueous solutions of quinine is valuable, as the retarding effects of the neutral quinine salts on the gastric digestive process are thus counteracted. Therefore, as has long been supposed by therapeutists, quinine has a tonic effect upon the digestion, which is most marked in persons with a weakened digestion. An editorial[80, Jan.] reviews the different salts of quinine which are used hypodermatically, and ranks them in the following order: hydrochlorate of quinine and urea, bisulphate, hydrochlorate, and, last, the sulphate. The hydrochlorate of quinine and urea is soluble in equal parts of cold water, and is prepared by adding 20 parts of the muriate of quinine to 12 parts of hydrochloric acid and 3 parts of urea. Berthelot[8, Dec.14,'90] says that the buzzing of the ears produced by quinine is due to the general excitation of the acoustic nerve, and to there being simultaneously reproduced all the different kinds of sensations which the nerve is capable of receiving by the impressions of external agents. F. H. Stuart[157, Oct.] finds that a most excellent method of giving quinine by the hypodermatic method is by means of the following solution:—

℞ Quininæ muriat.,	1 drachm	(3.89 grammes).
Chloroformi,	1 drachm	(3.89 grammes).
Vaselini,	1 ounce	(37.00 grammes).

Of this, an amount containing the dose of quinine desired is to be rubbed into either the inner aspect of the thighs, or the sides of the chest posterior to the pectoral muscle, a new place being chosen for each application.

The sulphovinate of quinine may be prepared by mixing together an alcoholic solution of the sulphate of quinine with an alcoholic solution of the sulphovinate of sodium. The product must be distilled, in order to eliminate the alcohol before crystallization. Such a compound consists of 56.25 per cent. of quinine.[26, May] Constantin Paul was the first to use this preparation hypodermatically. Juillard has found a solution of 1 part of sulphovinate of quinine in 9 parts of distilled water very valuable for injections in the treatment of marsh fevers. F. E. Hare$^{6}_{\text{Apr. 26}}$ quotes Walter Foster as finding quinine of great service in reducing the pulse-rate in Graves's disease. Hare believes that quinine is a cardiac stimulant, and that under its use the pulse-rate in typhoid fever was lowered; although, while it rose with the returning temperature, the pulse almost always failed to attain its previous frequency. Sometimes it even remained slower, in spite of the temperature having gained an even greater elevation. Not uncommonly, when the drug failed altogether in reducing the temperature, the pulse-rate was lessened; but sometimes it was found that there was a lowering of the pulse-rate even by doses of quinine too small to be of any antipyretic value, and that hence the independence of its action on the circulation is established. Usually, twenty-four hours are required before the slowing of the pulse is perceptible. The effect, when once obtained, is somewhat permanent; so that if the quinine be withheld the pulse does not return to its former amount of speed. This action is not limited to typhoid fever alone, but was also seen in the last stages of phthisis, in croupous and broncho-pneumonia, and hectic surgical cases. Vigier$^{363}_{\text{May 28}}$;$^{112}_{\text{Oct.}}$ finds that when the lactate of quinine is freshly prepared it dissolves in four times its weight of water, while if it be already crystallized it requires sixteen times its weight of water, in order to dissolve it. He gives the following method of preparing a 20-per-cent. solution: 21.5 grammes (5½ drachms) of sulphate of quinine, representing 16 grammes (4⅞ drachms) of quinine, are dissolved in 500 grammes (14 ounces) of distilled water acidulated with 27.5 grammes (7⅛ drachms) of sulphuric acid diluted to one-tenth. Then 29 grammes ($7\frac{3}{7}$ drachms) of ammoniac are to be added, and the whole is to stand twenty-four hours, the mixture being occasionally agitated. The hydrate of quinine is to be washed with distilled water, collected upon a filter-paper, and 100 grammes (3⅜ ounces) of hot distilled water are then to be added. This is to be put upon a water-bath, and 4.25 grammes ($1\frac{1}{10}$ drachms) of pure lactic acid are to be added, until the mixture has just a slight acid reaction. The whole is to be cooled, filtered, and diluted to 100 grammes (3⅜ ounces). Five grammes (1¼ drachms) of such a solution contain 1 gramme (15½ grains) of pure lactate of quinine. I. V. Troitski$^{586}_{\text{Apr. 16}}$;$^{1}_{\text{July 16}}$ does not approve of the dermic method of administering quinine, though the best results are obtained when the quinine is dissolved in glycerin and alcohol, and applied as an inunction to the posterior thorax. The quinine can be detected in the urine after the inunction, but the amount is too small to possess any decided therapeutic effect. In children above 7 years of age the amount absorbed is very small. The good effects alleged to have been produced by the application of certain lotions, were really due, according to Troitski,[6, May 16] to the refrigerating action of the spirit on the skin.

C. C. P. Clark[80, Dec., '90] has obtained excellent results from the use of the tincture of cinchona in the treatment of rheumatic fever. He states that all the cases treated by him (only 3 are reported) recovered in less than a week. The remedy was given in ½-ounce (11.66 grammes) doses, every four hours. George Dock[61, July 18] prepares a solution of quinine, for hypodermatic use, in the following manner: The sulphate of quinine is used, and 1 drop of dilute sulphuric acid is added for each grain (0.065 gramme) of the sulphate. Enough water is then added to make 25 to 30 minims (1.55 to 1.87 grammes). About 5 grains (0.3 gramme) make a good dose to be administered at any one time. If more than this be desired, 2 injections should be given. The solution should always be freshly prepared. Thomas Temple[115, Aug.] does not believe that, as a general rule, quinine should be administered in high fever, when the pulse is hard, the tongue thickly coated, and the stomach irritable.

Pispiris[73, Aug 15] describes some severe toxic and fatal accidents which he has observed from the use of quinine. He has noted gastro-intestinal hæmorrhage produced in one hour if the quinine be taken by the mouth, and in nine to ten hours if it be applied to the skin as an inunction. He has seen, with other Grecian observers, severe urticaria, and even true hæmorrhage of the skin and of the mucous membrane, in the form of petechiæ or vesicles. Hæmoglobinuria has been produced, of which the author has published 2 cases. In 1 case the patient died the same day, and, in the other, within forty-eight hours after the administration of the quinine. Two cases have also been published in which persistent vomiting and diarrhœa were produced. He also notes 1 case of amaurosis, which lasted sixty-three hours after the administration of the quinine. In a female, 32 years of age, he has seen a dose of 0.30 gramme ($4\frac{3}{5}$ grains) produce an attack of hysteria in a person free from fever, and not of a neurotic temperament. A. B. Ball[59, Dec. 8] has seen a single 1-grain (0.065 gramme) dose of quinine produce an eruption resembling scarlatina, and a swelling of the tongue so as to cause it to protrude from the mouth. A similar effect was noted, after employing this dose, on three separate occasions.

T. P. Satterwhite[224, Apr. 11] reviews the literature on the ecbolic and exanthematous effects of quinine. An interesting case, occurring in a middle-aged woman, is reported by Glax,[6, Jan. 17] in which the ingestion of $1\frac{1}{2}$ grains (0.097 gramme) of quinine—certainly a small dose—was followed by the appearance of a scarlatinoid rash over the whole surface of the skin, accompanied by painful swollen throat, the patient exhibiting the appearance of one suffering from scarlatinoid rheumatic fever. The symptoms, however, disappeared in a few hours. A case of idiosyncrasy against quinine, in a man 30 years of age, is reported by Joseph Leidy, Jr.[112, June] Two-grain (0.13 gramme) doses always produced, in a short time, amblyopia. The drug was tried, in the same quantities, in this person, three different times, and always with the same untoward effects. W. D. Collins[186, June] relates 2 cases of fever, supposed by the patients to be of malarial origin, which he thinks were produced by large doses of quinine.

Randia Dumetorum.—James Sawyer[6, Mar. 21] has been using an ethereal tincture of the Indian *Randia dumetorum* as a nervine and antispasmodic, in cases in which antispasmodics were indicated. The drug contains valerianic acid, and is said to have as its active principle a glucoside allied to saponin. In India the fruit is held in high repute for its emetic properties, the emesis being produced in about fifteen minutes after taking the drug. In India the bruised fruit is thrown into the water for the purpose of stupefying and catching fish. The dose of the ethereal tincture is 15 to 60 minims (0.80 to 3.38 grammes) diluted with water, with which it forms a milky mixture. With iron it gives a greenish coloration.

Resorcin.—Andeer[6, Dec. 20, '90] has used resorcin in diphtheria with great benefit. Various authors are quoted, among them Leblond, Baudier, Besnier, Thorens, and others, who have also derived great benefit from its use in this affection. W. C. Chapman[198, June] believes that its internal use is attended with powerful antipyretic effects, as well as antifermenting properties. It can be easily administered, being freely soluble, with a pleasant taste, and free from disagreeable odor. It does not cause nausea and vomiting. The author especially recommends it in hyperpyrexia of septicæmia, malaria, typhoid fever, measles, dysentery, and cholera infantum. Resorcin is most valuable in those cases where fever is attended with a tendency to intestinal derangement.

Alfred Eichler[19, Jan. 21] finds it useful in catarrh of the posterior nares and of the pharynx, and in various affections of the upper air-passages. He considers the following a good formula for this purpose:—

℞ Resorcin, ...	2 drachms	(7.78 grammes).
Salicylate of sodium, . . .	1 drachm	(3 89 grammes).
Biborate of sodium, . . .	1 drachm	(3.89 grammes).
Glycerin, ...	2 fl. ounces	(75.00 grammes).
Water, to make	8 fl. ounces	(240.00 grammes).

M. and dissolve. S.: Use freely three times daily.

Whooping-cough, asthma, bronchitis, and laryngeal ulcers are said to be benefited by its use. Eichler differs from some German observers in finding it of little use in acute affections like croup and diphtheria. As an injection in the later stages of gonorrhœa it seems to be attended with benefit. G. Cattani[17, Sept. 5] considers it a parasiticide, especially in diphtheria. Cocaine is added to the solution, which is applied to the throat, in order to avoid any laryngo-pharyngeal spasms. Cattani has treated 34 cases of scarlatina by means of a 10-per-cent. solution applied to the skin, and in no case has observed any post-scarlatinal nephritis. In washing out the cavity of pyothorax this author has used, with good results, a 5-per-cent. solution, at a temperature of 37° C. (98.6° F.). With other authors, he recommends resorcin in affections of the gastro-intestinal tract, given one hour before meals. The following is used with success in causing the cessation of pain and the arrest of vomiting in cancers of the stomach:—

℞ Resorcin, ...	2 to 3 grammes	(31 to 46 grains).
Chloroform, ...	3 grammes	(46 grains).
A bitter tonic, ...	250 grammes	(8 ounces).

Dose: Two large teaspoonfuls each morning and one before each meal,—the dose to be gradually increased.

L. Reuter[953, p. 391] gives a test to distinguish resorcin from naphthalin and the alpha- and beta- naphthol. Fifty grammes (1¾ ounces) of caustic potash are added to chloroform or bromoform, or, still better, to chloral hydrate or bromal hydrate, and heated with 0.10 gramme (1½ grains) of the agent under consideration, and the following colorations may be noticed: The resorcin will give an intense ruby-red color; the naphthalin is insoluble, and there will be no change; the alpha-naphthol will change from dark blue to a greenish blue; the beta-naphthol will change from blue to a yellowish blue.

M. C. Brasher[192, Jan.] has tried the action of resorcin on a malignant growth of the face of two years' standing. An aqueous solution of 30 grains (1.94 grammes) of resorcin to the ounce (30 grammes) was applied five or six times a day. The burning pain was stopped at once. The growth was removed in three weeks, and there was no tendency to return in three months, the skin looking smooth and healthy. H. Menche,[319, v.12, No.21] after using resorcin internally for nine years, recommends that it be used in the diarrhœas of children which are attended with vomiting. Teaspoonful doses should be given, every two hours, of 0.3 to 0.5 gramme (4⅗ to 7¾ grains) of the resorcin in 100 cubic centimetres (3½ ounces) of the menstruum used. For adults the same dose of a 1-per-cent. solution yields good results in the different stomach troubles, such as carcinoma, dilatation, vomiting of pregnancy, sea-sickness, and also as an hypnotic in this latter ailment. It is important that the pure preparation be obtained. It can be combined with other medicines, such as opium, hydrochloric acid, condurango, etc.

Retinol.—F. Vigier[24, Nov.16,'90] states that retinol, discovered in 1838 by Pelletier and Walter, is one of the products of the destructive distillation of resin. It has for its formula $C_{35}H_{16}$ and is a yellowish or brownish liquid of a specific gravity of 0.900. The yellowish variety is the pure form, and should be preferred for use in medicine. It will hold in solution bodies which are often difficultly soluble in ordinary menstruums, such as salol, 1 to 10; iodol, naphthol, and aristol, 1 to 50; camphor, 1 to 20, etc. It is capable of being mixed in all proportions with codliver-oil, and also mixes readily with vaselin, turpentine, etc. Barbier is quoted as reaching the following conclusions, from its use in otology and rhinology: Retinol is an excellent antiseptic, its principal advantages being that it is not irritating, its application provokes neither pain nor active reaction, it does not become rancid, it is not altered by time and by light, it is a long-acting antiseptic, its price is moderate, and it possesses the property of dissolving or mixing with a great number of useful medicines. Adrian[3, Feb.,4] does not approve of the administration of phosphorus in retinol, while Constantin Paul believes that it merits trial.

(For a method of dissolving phosphorus in retinol, see the article on "Phosphorus.")

Rhus Toxicodendron.—According to John M. Maisch,[237, Jan.] the leaves of this plant are used in Mexico in the treatment of incontinence of urine. It is also employed against the bites of poisonous animals, by simply bathing the parts affected with a strong, hot decoction. The juice, in doses of 5 drops each, is given for coughs with a hot, aromatic infusion. A tincture of the fresh leaves is used by Garcia[237, Jan.] in the treatment of elephantiasis. The drug is recommended by J. Lindsay Porteous[36, Dec.,'90] in the treatment of chronic rheumatism. The author reports a case of a woman, 42 years of age, suffering from this disease, who was entirely relieved by this remedy. He likewise affirms that it is of great value in rheumatic gout and lithæmic tendencies; in the neuralgic pains of typhoid fever, and even in the paralysis which follows in the wake of this disease. Scaly forms of skin disease are said, similarly, to yield to this powerful drug. It should be employed in ½-drop doses of the German tincture three times a day. E. Carmichael Rothrock[176, Jan.] writes that rhus toxicodendron is the best brain and nerve stimulant with which he is familiar. W. O. Wilkes[85, Aug.] recommends the fluid extract of Virginia snake-root as a topical application for the eruption of rhus poisoning. Silas Hubbard[199, Nov.] considers the best time to make the tincture of rhus toxicodendron to be the last of May or the first of June. It has been recommended in ½-drop doses three or four times a day in the treatment of neuralgia and rheumatism. The author thinks it has a slightly narcotic and somewhat quieting effect upon the system.

Sabadilla.—E. Merck[814, Apr.; 673, May] has determined from sabadilla two new alkaloids, called by him *sabadine* and *sabadinine.* These principles differ from veratrine in that the stimulatory effect is by far weaker in *sabadine*, while in the *sabadinine* it is entirely absent. The new alkaloids do not precipitate from cold solutions, but when these are slightly heated the drugs drop in flocculi.

Sabal Serrulato.—Herman Rietze[186 Jan.] finds the saw-palmetto, combined with tonics, to be of use in sexual debility.

Saccharin.—C. Kornauth[2018 v.38,p.341] has found that saccharin purum possesses but feeble antiseptic properties. Animals, such as the dog, goose, and pig, which were fed for a long time upon saccharin, seemed in no way to be unfavorably influenced. It was also found that repugnance to saccharin was only present in certain individual cases, and was not general, as has been stated. C. A. Crampton[144 June] inveighs against the use that is now made of antiseptics in preserving food. Samples of cherry wine and unfermented wine were shown to contain saccharin. The author considers this to be the first published record in America of the use of saccharin for this purpose. In order to protect the production of sugar, $10 is charged on each kilogramme (2½ pounds) of saccharin imported into Belgium.[107 Sept.] In Germany it is considered an adulteration if this substance be mixed and sold as sugar.

Sage.—Cadéac and Albin Meunier[211 May 31] consider the essence of sage a very powerful vulnerary, and state that if 0.15 to 0.20 gramme (2⅓ to 3$\frac{1}{10}$ grains) of the essence of absinthe, injected intra-venously, are necessary to produce an attack of epilepsy in the dog, it only requires 0.05 gramme (⅘ grain) of the essence of sage, introduced into the veins of a dog weighing 6 or 7 kilogrammes (15 to 18 pounds) to produce a succession of two or three epileptic crises. The convulsive explosion has an exclusive bulbar origin, the cord only taking part indirectly, but increasing the severity; 0.25 to 0.30 gramme (3⅘ to 4⅗ grains) was found sufficient to kill an animal weighing 5 or 6 kilogrammes (13 to 15 pounds) without giving time for the production of an epileptic attack.

Salicin.—From an experience of 215 consecutive cases of influenza treated with salicin, E. B. Turner[6 July 18] recommends this drug, in proportion to the age of the patient, as being, when freely administered, a safe, sure, and successful method of treating this very troublesome ailment.

Salicylamid.—W. B. Nesbitt[80 Oct.] theoretically favors salicylamid: 1. Because it is a modification of a long and favorably known remedy—salicylic acid. 2. Because it is as tasteless as the latter is unpleasant. 3. Because, on account of the amidogen radical, it should be safer than salicylic acid. His conclusions, after using the drug, are that it is more soluble than salicylic acid, that it acts more promptly and in a smaller dose, that it has greater analgesic properties, and is pharmacologically safer.

Salicylate of Sodium.—Lennox Browne[2 Aug. 1] finds salicylate of sodium of value in the milder cases of diphtheria and of follicular tonsillitis. He makes a mixture of the salicylate with chlorate of sodium, which he finds less depressing than the corresponding salt of potassium. C. Mittenheimer[132 Sept.] speaks highly of the drug as an emmenagogue. J. G. Spenzer[199 Sept.] has made an examination of the different varieties of this drug found in the shops, in order to show why the sodium salicylate is not prepared of a uniform standard, and why the American article is inferior to that which is imported. The pharmacopœial requirements of this drug are stated to be small white crystalline plates, or a crystalline powder, permanent in the air, odorless, having a sweetish, saline, and mildly alkaline taste, and feeble acid reaction. Soluble in 1.5 parts of water, in 6 parts of alcohol at 15° C. (59° F.). Ignited, it leaves the alkaline residue, amounting to between 30 and 31 per cent. of the original weight. From his experiments he concluded that three corrections might be made in the pharmacopœial requirements. It should be soluble in an equal weight of water and in 5 to 6 parts of alcohol, and both of these solutions should be colorless. It should leave very nearly 33 per cent. of residue on ignition to constant weight. It should acquire only a faint amber solution when it is agitated with concentrated sulphuric acid. Spenzer[222 Jan.] also states that nothing seems to be desired beyond the present crystalline synthetic form of salicylic acid; at least, as far as a chemical examination can show. Mann[185 Aug.] records a case of rheumatism in which delirium occurred from the use of salicylate of sodium. The man took the whole of the amount ordered, 2 drachms (7.78 grammes), in two doses during the afternoon. The following morning there was delirium, hallucination, etc. Stoner has seen double vision and a depression of the circulation in those who were taking large doses of the salicylate of sodium.

Salicylbromanilid.—C. S. Bradfute[138 Apr.] has been studying antinervin, or salicylbromanilid. It is a white crystalline powder, having a rather pleasant but slightly acid taste, freely soluble in hot water, but sparingly so in cold. The dose is 3 to 10 grains (0.19 to 0.65 gramme). It is suggested that the drug be abbreviated to salbromalid. Radlauer, its introducer, claims that it possesses an antidiabetic action, although in one case of diabetes no diminution in the amount of water and sugar excreted was observed. Its chief value is in the relief of pain, and in those functional disturbances of the circulatory system which appear at the onset of acute diseases; also, in certain other conditions in which we have an over-acting heart and contraction of the arterioles. It is most effective in robust subjects. It has an undoubted antipyretic action, but on account of its effect upon the heart should be avoided for this purpose in cases of low fever. Frank Woodbury,[760] July 26 has successfully employed the new substance for the following purposes: to relieve pain; to produce sleep; to allay spasmodic cough; to reduce fever, and to arrest fermentation in dyspepsia. Five to 8 grains (0.32 to 0.52 gramme) were given at a dose, especially in cases of neuralgia or migraine. In cases of *la grippe*, it diminished muscle-pains, headache, backache, etc., and the writer believes that in larger quantities than those mentioned it would lower abnormal temperature. The salbromalid was well tolerated by the stomach, and, although not so promptly as other antiseptics, it checked fermentation.

Salicylic Acid.—S. Seilikovitch,[760] June 18 gives numerous formulæ for the use of salicylic acid. He has seen it replace iodoform, with advantage, as a topical application. For the treatment of acute rheumatic polyarthritis in children, the salicylate of sodium was found by Demme,[650] Jan. 1; [161] Mar. to be vastly superior to all other antipyretics, provided there was no intolerance on the part of the digestive organs. The drug was employed in three or four divided doses, as follows: for children 2 to 4 years old, 0.5 to 1.0 gramme (7¾ to 15½ grains); 5 to 10, 1.0 to 2.0 grammes (15½ to 31 grains); 11 to 15, 2.5 to 3.0 grammes (38¾ to 46 grains). When there was a tendency to diarrhœa or vomiting, the drug was substituted by salol, with good results.

As a local application in the treatment of diphtheria, J. Simon[17] Mar. 26 uses the following solution:—

℞ Salicylic acid, . .	0.50 to 1 gramme (7¾ to 15½ grains).
Alcohol, ...	q. s. to dissolve.
Glycerin, ...	40.00 grammes (1⅜ drachms).
Infusion of eucalyptus, .	60.00 grammes (2 ounces).—M.

After drying the diphtheritic membrane, the above solution is to be applied hourly during the day and every third hour during the night. The membrane is to be removed, and every seventh hour the throat is to be irrigated with a glassful of warm Vichy water, or a boracic-acid solution of the strength of 1 to 25.

Vanden Corput,$^{17}_{\text{July 28}}$ has found that the virile power is diminished in patients to whom are prescribed such antiseptics as salicylic acid, quinine, menthol, and carbolic acid. He has also found that salicylic acid prolongs the menstrual period. Ralph Stockman $^{2}_{\text{Nov. 22, '90}}$ does not believe creasotic acid to be the cause of those unfavorable symptoms which have been, at times, observed from the use of an impure salicylic acid, as the action of creasotic acid is similar to that of salicylic acid.

Salipyrin.—Salipyrin has as its true chemical formula antipyrin salicylate. From the careful study of 1 case, Oscar Kollmann $^{34}_{\text{Nov. 26, '90}}$ concludes that salipyrin is a powerful antipyretic and resolvent; that its action is central; that 6 grammes (1½ drachms) as a normal daily dose is too large; that even 3 grammes (46 grains) in one day may give rise to highly alarming symptoms; that if this drug be administered, small doses should be commenced with, in order that any idiosyncrasy may be noticed; and that the drug should not be continued for any length of time. Paul Guttmann $^{41}_{\text{May 18}}$ has used it as an antipyretic and in acute and chronic rheumatism and sciatica, in doses of 15 grains (0.97 gramme), until 90 grains (5.83 grammes) have been administered in twenty-four hours. In 1 case there was a fall of temperature ranging from 2½ to 3½ degrees in the third to the fourth hour after taking the drug. A gradual rise came on at the end of four or five hours, at which time the temperature had nearly reached its original height. The fall was accompanied by perspiration and a reduction of the pulse frequency. In 1 case an eruption similar to that produced by antipyrin was noticed.

Salol.—Edward Egasse $^{67}_{\text{Oct. 15}}$ gives some prescriptions for the use of salol. As an internal antiseptic in typhoid fever and cancer of the rectum, he recommends salol, 10 parts; olive-oil and water, each 60 parts. For impetigo contagiosa and pustular eczema, he recommends a collodion, composed of salol, 3 grammes (46 grains); chlorhydrate of cocaine, 0.20 gramme ($3\frac{1}{10}$ grains); and collodion, 20 grammes (5¼ drachms). If salol is brought in contact with camphor, with the application of a slight heat, a liquid is produced which is of a syrupy consistency, colorless, and possessing a very strong odor of camphor, but not as irritating as that of naphthol camphor when applied to the skin. W. B. Cox[186 Apr.] has had gratifying results in a case of puerperal fever from the use of 15 grains (0.97 gramme) of salol every four hours.

L. Jacquemart[100 Apr.23] concludes that salol notably ameliorates the pains which accompany certain forms of chronic rheumatism, when not of too long duration. It also seems to arrest the evolution of certain articular lesions in chronic rheumatism.

Alfred Eichler[19 Apr.18] considers salol a most useful addition to our materia medica. Cartaz[121 Aug.] states that he has met with a number of cases in which an erythema of the face was developed by insufflations of salol. The eruptions were acute, and at times both intense and extensive, and remained as long as the treatment continued. In a discussion of the paper, other members of the Parisian Society of Otology and Laryngology said they had noticed the same thing,—more especially when the salol was used in connection with fatty bodies. Fr. Chlapowski[783 No.4,'90] quotes a case in which Aufrecht and Behm gave salol in endocarditis, with fatal results. He adds a new one, in which a 30-year-old prostitute, very sick with gastric disturbance, was given 1 gramme (15½ grains) of salol, in order that the motor strength of the stomach should be tested by Ewald's method. The patient soon became uneasy, then unconscious, with dilated pupils, and the dark-colored urine was found to contain salicylic acid; there was an irregular pulse and continuous vomiting. Death occurred twelve days later. The post-mortem showed gastritis and hæmorrhagic enteritis. A cicatrized gastric ulcer was found, chronic endometritis, and a cyst of the ovary. Chlapowski considers that the fatal result was undoubtedly due to the 15 grains (1 gramme) of salol. It is recommended, in order that such cases as this may be avoided, that a soluble sulphate, such as Glauber's salt, be given during the administration of the drug to a patient who is either weak or possesses an idiosyncrasy to the use of carbolic acid. Hesselbach[41 May 18] reports that 2 drachms (7.78 grammes) of salol, taken by a man suffering from acute rheumatism, with old cardiac disease and interstitial nephritis, caused death two days later from an attack of acute nephritis. The author concludes that the toxic principle is the phenol, and that a diseased condition of the kidney is a contra-indication of the use of salol.

Salol and Phenacetin.—T. Madison Broadus[139] relates a case in which two doses of 5 grains (0.32 gramme) of equal parts of phenacetin and salol caused, in three-quarters of an hour, an urticarial eruption covering the whole body. There was intense itching associated with the rash. The patient had previously taken phenacetin and salol, but never together, and had noted no unpleasant effect. It is stated that quinine salts affected her in the same manner, but the writer is certain that these capsules did not contain quinine.

Santonine.—August Schmidt[282] reports the case of a girl, 4 years and 11 months old, who was given, without the advice of a physician, 2 grains (0.13 gramme) of santonine about 6 A.M.; the same day, at 11 A.M., a second 2-grain dose, and the third dose of the same amount at about 3.30 P.M. on the same day. During the evening the child was not as lively as usual. At 5 A.M. next day she motioned to her mother that she desired to have a passage, and urinated in her bed, which was something unusual for her to do. She got up and ate a very light breakfast, complained of headache, seemed drowsy, and could not sit up straight. A short while after this, convulsions came on. When seen by Schmidt, in the afternoon, she had been placed in a tub of hot water with mustard. Cold was applied to the head, and chloral hydrate and bromide of potassium were administered internally. Inhalations of ether were also employed. At first the convulsions were limited to the face. They then became unilateral, and, finally, general, until death occurred, which happened in about an hour and a half after the onset of the convulsions. She was unconscious throughout the whole of this time. One year previous to this the child had had a convulsion after taking 2 grains (0.13 gramme) of santonine. Six months previously she had also had a slight convulsion from having run in order to escape a storm.

Santoninoxyne.—Coppola[17] thinks that he has found in santoninoxyne a safe and reliable substitute for santonine. This new preparation can be used as an anthelmintic in three times the dose of santonine, without any injurious effects.

Serum.—Feulard[3] administers internally to syphilitics the serum of the dog, in which bichloride is dissolved in the proportion of 1 to 2000. The patients take two, three, or four teaspoonfuls of this mixture in milk, which would correspond to one or two teaspoonfuls of the Van Swieten liquor. The medicine is admirably supported by the stomach, and the bad taste of the bichloride is sufficiently masked. In these cases it was found that the weight was sensibly increased. Feulard confirms the good results of Richet and Héricourt, which they predicted from their laboratory experiments. It would seem, therefore, that the injections of the serum of the dog are completely non-toxic, if properly made, and constitute a tonic in cases of organic debility, and especially in tuberculosis. Charles Luzet[152, May] finds that if the serum of a dog be mixed with the blood of a man, or that of a man be mixed with the blood of a dog, there are produced alterations more or less pronounced, and that bloody concretions of a very solid nature will be formed, which theoretically may give rise to emboli. Dogs' blood has been employed by Semmola,[57, No.] in phthisical patients, with no very satisfactory results. Ten patients were treated, each receiving at first 2 cubic centimetres (31 grains) of dogs' blood, afterward 10 cubic centimetres (2½ drachms), and in this case the injections were followed by disagreeable symptoms. In 4 severe cases the blood did not produce a favorable influence; in the other 6, there was improvement after the first week. The lung condition was considerably improved in 3 cases; in 2 there was complete disappearance of the infiltrating process, and the body-weight increased; the hæmoglobin, the urea, and the respiratory capacity were also increased. Ch. Richet[3, Jan.] has made a few observations upon the hypodermatic injection of the serum of the blood of dogs, showing that patients suffering from laryngeal and pulmonary tuberculosis were benefited by these injections, both as to the local lesion and as to their general health. They increased several kilos in weight while under treatment. From a number of experiments made, it was safe to assume the complete harmlessness of the treatment. From some experiments made by Roger,[297, No. 3] it would seem that blood-serum greatly diminishes the virulence of microbes.

Silicate of Sodium and Aluminium.—G. G. Davis[112, Sept.] states that soluble glass, composed of the silicate of soda and aluminium, is not as much used as a surgical dressing as it should be. Methods of preparing the bandages and directions for making spinal jackets and splints of various kinds are given.

Silver.—Diday[211] has been studying the relative advantages of the sublimate and nitrate of silver in cases of gonorrhœa, and finds that the results of the bichloride are very irregular. The action of the nitrate of silver, on the other hand, can be calculated with almost certain accuracy according to the amount administered. Diday prefers this agent to any other, and as an abortive treatment employs the strength of 1 to 20, as an ordinary injection 0.10 to 0.15 gramme or 0.80 gramme (1½, 2⅓, or 12⅓ grains), and finally, as an antiseptic, 0.05 gramme (⅘ grain) to 100 cubic centimetres (3½ ounces) of water. Boudet agrees that this agent is preferable to the bichloride. A. Barillé[213 Aug.] has found, from a chemical examination of the wrappings of silver-nitrate sticks, that the usual forms are not sufficient to prevent loss of the silver and the formation of other compounds. He recommends that for war purposes the sticks should be preserved in powdered pumice-stone, and that they be placed in bottles made of yellow glass.

Simonillo.—*Lænnecia parvifolia*, or simonillo, as it is commonly called in Mexico, has been employed by Altamirano[237 Jan.] as an aperient, in the form of pills made of the extract. The same author has used it as an infusion in the treatment of biliary calculi. (Report of Semeleder, corresponding editor, Mexico.)

Soap.—William R. D. Blackwood[196 Jan.] thinks that skin eruptions in the baby are often due to the soap containing too much alkali.

Sodium.—Isaiah Miley[53 Jan.] reports the case of a man who was healthy until the age of 69 years, and who had been accustomed, for twenty years, to take daily 200 grammes (6⅝ ounces) of soda. During this length of time he took, according to the writer's calculation, 2500 pounds of baking-soda. He had begun taking the soda for a sour stomach, and had kept it up in these large doses for so many years. Alkaline injections in the treatment of gonorrhœa have given the best results in the hands of Castellan.[121 Sept.] A large number of cases are reported cured by a solution of 1 per cent. of bicarbonate of sodium. The average time required to effect a cure was twenty days. O. Leichtenstern[6 Aug. 29] publishes 7 cases in which an infusion of a solution of chloride of sodium was very successful in counterbalancing most serious losses of blood.

Kirstein[112 Apr.] has used the transfusion of 20 and 25 fluidounces (600 to 750 grammes) of a $\frac{6}{10}$-per-cent. solution of common salt in typhoid fever with good antipyretic results. He suggests that such a transfusion may do good by diluting the poison or by having a direct chemical action on the blood. An unknown substance was found in the urine after the transfusions. Hampeln$^{21}_{\text{May 18}}$ has used an infusion of salt water in 3 cases,—1 of carbonic-oxide poisoning, 1 of uræmia and diabetic coma, and 1 of diphtheria, in which there was inability to swallow. The first case could not be saved, but in the second the results were most favorable. In the last case 2 abscesses occurred. Mercklin, Wolferz, Hach, Helling, and Schabert in the main approve of these injections.

Sodium Tellurate.—Of the four tellurates of sodium, Combemale$^{67}_{\text{Jan. 16}}$ has employed the "normal" salt, so called, which has the formula of NA_2TeO_4—$5H_2O$. The drug was given to 11 patients, in doses of from 0.02 to 0.05 gramme ($\frac{2}{7}$ to $\frac{4}{5}$ grain), dissolved in alcoholic mixture. Of these cases, 7 were tuberculous, 2 had typhoid fever, 1 acute rheumatism, and 1 suffered from gastric ulcer. The author arrived at the following conclusions: (1) tellurate of sodium given in phthisis has a powerful effect on night-sweating; (2) doses of 0.05 gramme ($\frac{4}{5}$ grain) daily produce the desired effect with certainty,—smaller doses are less certain; (3) an odor of garlic may sometimes be imparted to the breath,—its prolonged administration leads to some disturbance of digestion; (4) the drug succeeds in all stages of tuberculosis, but a larger dose is required in advanced phthisis than in the earlier stages; (5) the results obtained are more striking than with any similar remedy,—camphoric acid, however, is the safer and better remedy for general use, possessing, practically, no disadvantages; (6) the action of both drugs would seem akin to an antiseptic effect, possibly producing destruction of the soluble products of the microbes; (7) the antihydrotic action is not confined to cases of phthisis.

Somnal.—W. Gilman Thompson$^{138}_{\text{Feb.}}$ prefers the effects of somnal to those of urethan, and thinks that the sleep produced by it is not so depressing as that of chloral. He also finds that somnal in doses of a drachm (3.89 grammes) is not powerful enough to decidedly control delirium tremens, maniacal delirium, or severe pain. He considers it of especial value to interchange with other well-known remedies, in order that a habit may not be formed. The drug has given good results as a hypnotic in the hands of Frank Woodbury.$^{115}_{\text{Dec.,'90}}$ It does not, like chloral, depress the system, and may be used with decided advantage in cases of insomnia, fretfulness, and restlessness of children. No evil after-effects have been noticed by the author.

Sozoiodol.—Schwimmer[560 Aug. 9; 80 Sept.] has used sozoiodol of zinc in the treatment of acute and chronic gonorrhœa, employing in the acute forms from ½ to 1½ per cent. of sozoiodolate of zinc in distilled water, to which 2½ per cent. of laudanum was added. In the chronic forms he replaced the laudanum by 1 per cent. of the salicylate of bismuth. The stronger solution was used in the first stage. In various syphilitic ulcers, in burns, ulcerated and contused wounds, and in the after-treatment of buboes, the employment of the sodium and potassium compounds of sozoiodol were more satisfactory than iodoform. For this purpose he employs the sozoiodol salt of sodium with five to ten times its weight of lycopodium powder, or, in the form of an ointment, 10 parts each of lanolin and liquid paraffin to 2 of the sozoiodolate of sodium and potassium. Schwimmer also uses it in vesical affections, and finds that it exceeds in value any mercurial with which he is acquainted for hypodermatic injection. He has employed this salt 1200 times hypodermatically, and in no case has an abscess formed.

Sparteine.—J. Houdas[129 May] believes that the sulphate of sparteine is indicated whenever the myocardium is relaxed by an alteration of tissue or when the force of the heart has been found insufficient to compensate for increased pressure. G. Sée,[31 July 2; 673 Aug.] regards sparteine and convallamarine as auxiliaries to other cardiac remedies. Julliard,[276 July 30] finds that a yellow precipitate is produced when the iodide of sodium and the sulphate of sparteine are mixed together. Care should therefore be taken in prescribing these reagents in the same solution.

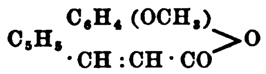
Spermine.—See Animal Extracts.

Strontium Salts.—Laborde, Sée, and Vulpian,[164 July 30] agree that the salts of strontium are very well borne, in large doses. Vulpian is quoted as finding that chronic rheumatic gout was markedly improved by the use of the bromide of strontium. C. Paul found that lactate of strontium could be given in daily doses of from 6 to 10 grammes (1½ to 2½ drachms), without any ill effects. Abdominal plethora and chronic Bright's disease were benefited by its use. Constantin Paul,[3 July 30] has employed the lactate of strontium for two months. The daily dosage of 8 to 10 grammes (2 to 2½ drachms) causes no harmful symptoms and diminishes the quantity of albumen. He cites a case in which albumen would appear upon the withdrawal of the drug, to be stopped again, however, by its renewed administration. G. Sée[8, July 29] has attained very good results from the use of the bromide of strontium in rheumatism and many other diseases. Laborde[3, July 8] has noticed that animals, when taking the salts of strontium, increase in weight and have better appetites, and are generally in a most healthy condition. He has also noted an augmentation in the urinary secretion and an especial clarification of the urine. The author's experiments were made with many salts of strontium, but more especially with the phosphate and the ortho-phosphate. He also recommends bromide of strontium, as, with this salt, certain phenomena, such as stupor and lassitude, which take place when the bromides of the alkalies are administered, were not observed.

Strophantine.—G. Sée[81, July 2; 673, Aug.] considers strophantine an energetic vaso-constrictor, and believes that it does not increase the force of the heart's action, except indirectly and temporarily.

Strychnine.—See Nux Vomica.

Styracol.—Styracol is described[575, Mar.19; 90, June] as being formed when an equal number of molecules of guaiacol and cinnamyl chloride are brought together and heated, at the end of two hours, for a short time, on a water-bath. The liquid is then treated with boiling alcohol and filtered. When cold, the solution will be found to contain long, crystalline needles of styracol. Its formula is:—



$$C_5H_5 \begin{matrix} C_6H_4\,(OCH_3) \\ \cdot CH:CH\cdot CO \end{matrix} > O$$

It is used in the treatment of tuberculosis. It is claimed that styracol is a powerful antiseptic, controlling fermentation and putrefaction; that the healing of wounds and ulcers is promoted by its use; and that, when administered internally, it gives benefit in chronic catarrh of the bladder, gonorrhœa, and catarrhal affections of the stomach and intestines.

Sulfaminol.—William Robertson[2, Aug. 29] has found sulfaminol to have a peculiar healing effect upon wounds, and to be especially valuable on account of its desiccating power in the after-treatment of nasal operations.

Sulphonal.—T. Sydney Short,[32, July] from a study of the use of sulphonal in 12 cases, found several which showed very clearly its uselessness when pain was a prominent symptom. In the other cases its action as a hypnotic was pronounced. David D. Stewart[9, Jan. 31] finds that the hypnotic action of sulphonal is much more prompt if it be given dissolved in boiling water, to which a teaspoonful of liqueur or crême de menthe has been added. If administered in this way, he says there is no need of giving the drug until bed-time. L. C. Toney[109, Jan.] has found sulphonal useful in many cases among the insane, and comparatively inert among others. He has used it in 100 cases, with 80 per cent. of successes, the average time in which sleep came on being three hours. The average dose administered was 12 grains (0.78 gramme). The patients slept seven hours, and the sleep was found to be more profound among children than grown persons. John Cumming Mackensie[138, July] prefers to give sulphonal dry on the tongue, to be followed by a liquid. He finds that the phosphates in the urine are increased by small and diminished by large doses. The urea is probably influenced in the same manner. Mackensie refers to 1 case in which there was an intoxicated gait and an inco-ordination of ideas, as was seen from speech and letter-writing. The action on the heart is opposed to that of digitalis. It was found that there was first a reduction of temperature, followed, however, by a rise above normal. The skin and tendon reflexes were increased, but on continuing the drug they gradually subsided, the patellar reflexes even eventually disappearing. The appetite was never impaired, but somewhat improved. In 1 case, in which 220 grains (14.25 grammes) were taken in twenty-four hours, an antidote of 4 ounces (108 grammes) of brandy and a pint of coffee acted well. The stomach was also washed out with a stomach-pump.

Under the direction of T. Cash, Charles Angus, William Bullock, and John Gordon[2, July 18] have made a critical investigation of sulphonal and chloralamid. Doses of 10 to 45 grains (0.65 to 2.93 grammes) were used, with the production of a sleep lasting six to nine hours. In 1 case of acute suicidal mania the sulphonal was given over thirty times, and always with good effect. One patient—a dyspeptic—slept for twelve hours after a 40-grain (2.59 grammes) dose of sulphonal. She suffered, after awakening, from pronounced giddiness and headache, with vomiting and a feeling of faintness. Forster[22, Sept. 2] used 9000 grammes (18 pounds) of sulphonal in the treatment of 56 patients. He was favorably impressed with the benefits to be derived from the employment of this drug, and considers that it acts principally as a motor depressor. H. L. Rosenberg,[760, Jan.24] relates a case in which an attack of asthma was cut short by a 15-grain (0.97 gramme) dose of sulphonal. J. Roubinovitch[138, Apr.] administers sulphonal either in the form of a powder inclosed in a cachet (in which case the patient takes immediately afterward a glass or two of herb-tea or some warm soup) or mixed with soup or wine. Tabulated cases are given showing the dose, the number of hours intervening between the taking of the drug and the production of the sleep, and the number of hours of sleep produced. The drug was used in 24 different cases, and, out of 275 doses given, sleep occurred in 263 instances. The sulphonal was not successful as a soporific in the following cases: 1 case of multiple fracture, 1 of chronic mania, 1 of general paralysis, and 1 of cerebral apoplexy. It was found that 0.75 to 3 grammes (11½ to 46 grains) generally determined, in two to four hours, four to nine hours of sleep,—usually calm, continuous, profound, the maniacal excitement being lessened when the patient awoke. It is wise to give a full dose on the first day and quarter doses on the following day, as has been recommended by Mairet. D. P. Chamberlin[176, Dec.,'90] relates a case of insomnia, with bladder and urinary trouble, in which sulphonal was used almost continuously for twenty-six months. No bad effects were noted, and the commencing dose of 20 grains (1.3 grammes) could be reduced to 10 grains (0.65 gramme).

According to Cantù,[505, No.54] sulphonal is superior to camphoric acid and tellurate of sodium in the treatment of the night-sweats of phthisical patients. The drug, however, is unreliable. Graeme M. Hammond[242, July] has never observed any tendency upon the part of the patient to form a sulphonal habit. He does not believe that insomnia is cured by its use. The dose given varies from 15 to 20 grains (0.97 to 1.30 grammes) in certain cases, up to as much as 50 to 60 grains (3.24 to 3.89 grammes) at a dose. In one case, where intolerance was shown, 15 grains (0.97 gramme) of sulphonal produced almost immediately vertigo, stupor, and marked delirium, which persisted for several hours. The same symptoms occurred a few days later, after the administration of an equal quantity. S. Grover Burnett[72, Aug.] believes that sulphonal, under all circumstances, when judiciously prescribed, is certainly at the head of hypnotics in producing a refreshing, quiet, and physiological sleep, without a systemic reaction. He advises, in cases of melancholia, that the sulphonal be associated with ⅛ to ¼ grain (0.0081 to 0.016 gramme) of the pure aqueous extract of opium. The author also advises its use in the insomnia of the opium *habitué*. H. Bresslauer[650, Mai 1] tabulates 7 cases of sulphonal poisoning, 5 ending in death, out of 74 cases of various troubles for which this drug was given. The primary symptom was usually obstinate and prolonged constipation, requiring frequent injections. The action was frequently postponed, on account of the insolubility of the drug, and suddenly manifested itself in deep stupor, vomiting, and a weak and rapid pulse. The urine became small in amount, of a dark-violet color (due to indican), and showed the presence of epithelial and hyaline casts. Hatherly[28, Sept.] reports that Gilbert has observed 4 cases in which there occurred anomalies of handwriting, together with the other more usual signs of sulphonalism. It was found that all of the patients who were under the influence of sulphonal could not write in a straight line. The words they wrote were in an oblique direction, going from left to right, and from below upward. The characters were angular, and marked by great uncertainty. This writer is of the opinion that sulphonal has been used entirely too freely, and that great care should be taken in watching patients when they are using sulphonal. Ernst Neisser[69, May 21] reports at length a case of poisoning by sulphonal. The interesting features of the history are, first, the large dose,—100 grammes (3½ ounces) of finely-powdered sulphonal being taken with suicidal intention; and, second, the favorable ending of the case, with the following interesting symptoms: A sleep of ninety hours, with a but slightly-changed blood-pressure and breathing, an ataxic impairment of the gait and speech, and a symmetrical exanthema. The patient was found unconscious six hours after taking the sulphonal, which was used in two portions of 50 grammes (1¾ ounces) each. Vomiting occurred after the first portion, but, undoubtedly, a large portion was absorbed. The patient had no passage for five days, and unchanged sulphonal was found in the urine. It would, therefore, seem that the sulphonal has not a cumulative toxic action; at least, as long as the flow of the urine is free.

Tar.—The heavy oil of tar is chemically composed of creasote-oil, containing cresol, xylol, naphthalin, and various other phenols and hydrocarbons.[23, Feb.] These substances are strongly antiseptic, and enter very largely into the composition of many proprietary preparations now upon the market. Muselli[188, June 23] calls attention to the useful application of saponified coal-tar in the pustules of small-pox. In a case reported by him, good results were obtained in the prevention of pitting.

Tellurate of Sodium.—See Sodium Tellurate.

Testicular Fluid.—See Animal Extracts.

Tetronal.—See Trional.

Thallin.—In the management of febrile diseases of children by means of drugs, Demme[650, Jan. 1] has found thallin the most useful antipyretic in the treatment of enteric fever. It was administered as follows: For children of 3 to 4 years, 0.01 gramme ($\frac{2}{18}$ grain); of 5 to 10 years, 0.02 gramme ($\frac{2}{7}$ grain); and of 11 to 15 years, 0.03 to 0.05 gramme ($\frac{7}{19}$ to $\frac{4}{5}$ grain), *pro re nata.*

Theobrominate and Salicylate of Sodium.—See Diuretin.

Thiol.—Gottschalk[317, No. 12] has employed thiol for nine months in the treatment of various gynæcological affections, and believes it to be as effectual as ichthyol, and to have the advantage of being absolutely inodorous. In parametritis and perimetritis, tampons soaked with a solution of 10 to 20 per cent. of thiol in glycerin were used, and removed every two days. At the same time the abdominal parietes were rubbed with an inunction of thiol of the same strength, abundant secretion being thus produced. When applied to the stomach, it produces an effect similar to the tincture of iodine. Gottschalk has also used the powder in the treatment of erosions of the neck of the uterus, and has employed it internally. The chief drawback to its use is its high price. Stepp[34, Jan. 6] has used both liquid and dry thiol. The liquid thiol was generally diluted with an equal part of water, or with twice the amount of ether. It gave most excellent results, in nasal and oral eczema, applied with a brush two or three times a day. In herpes zoster a beneficial result was noted the next day.

Thymol-acetate of Mercury.—Tranjen[17, Oct. 13] has used thymol-acetate of mercury in the treatment of tuberculosis. Three parts were mixed with forty parts of paraffin liquid, and 15 drops of this solution introduced hypodermatically every seven or ten days. After the second or third injection, if fever existed, 0.40 gramme

(6⅕ grains) of iodide of potassium were administered three times a day. One hundred and eleven injections were given in 52 cases. In 2 of these stomatitis was produced. In some others the patients complained of severe pain at the point of injection. No other complications were noted. In commencing phthisis these injections produced a marked amelioration of the symptoms, and no unfavorable results were noted in advanced cases.

Tobacco.—Auché[188, No. 34] considers that, no matter how tobacco may be externally applied, it may occasionally give rise to toxic phenomena. Some interesting cases are quoted from the literature of the subject, one of which, reported by Nameas, is of interest: A smuggler who had covered his skin with tobacco-leaves to escape impost, presented extreme weakness of the pulse, cold sweats, and depression. Auché adds a case in which a man 50 years of age was covered with pediculi pubis. Not wishing to tell any one of his condition, he decided to use a wash, for his whole body, of a decoction of tobacco. There soon appeared heaviness of the head, nausea, vertigo, dimness of vision, cold sweats, excessive pallor of the skin, trembling, great weakness, etc. The author thinks that such toxic symptoms are capable of being produced, whether the skin be denuded or not; that its use is not free from danger, and that phenomena similar to those produced by the drug when taken internally may occur. Tassinari[50, B. 4, No. 15] has found that tobacco-smoke entirely prevents the development of some kinds of pathogenic bacteria, and hinders the development of other forms. In his experiments, the bacteria were placed on linen moistened with broth, and introduced for thirty minutes into an atmosphere of tobacco-smoke. It was found that if the smoke was first passed through water it did not possess the antiseptic effect noticed above.

Toboshi.—Y. Inoko[200, Apr. 25] finds that toboshi, a kind of mushroom growing upon the *Larix leptolepis*, and used as a sacred medicine among the natives of Yezo, contains an organic acid and a resinous compound. The author believes that the acid is no other than agaric acid, and he has used it with good results in 0.06- to 0.10-gramme ($\frac{9}{10}$ to 1½ grains) doses in the treatment of night-sweats.

Trichloracetic Acid.—Alfred I. Lanz[590, No. 1] has had very satisfactory results from the use of trichloracetic acid in the treatment of various venereal and cutaneous affections. It can be used in papillomata, ordinary warts, vascular nævi, pigment patches, indolent ulcers, obstinate gleet, and papillomatous urethritis. In a case of nasal nævus the new growth disappeared after the fourth application of the pure acid. The applications had been repeated once weekly, and an almost imperceptible scar remained. Gleitsmann[50, Mar.14] has used the trichloracetic acid as an escharotic in 200 cases of affections of the throat and nose. There is no need of an anæsthetic previous to cauterization when the acid is applied to the pharynx. For the nose, however, a 10- to 20-per-cent. solution of cocaine is used previous to the operation. The eschar produced is white and smooth, and usually dry. The inflammatory swelling is but slight, and the action is more strictly limitable than when other caustics are used. Good results were observed in 170 cases of hypertrophic conditions of the nose, but it was found to be of little value in removing cartilaginous spurs of the septum. Gleitsmann believes that it may be used with advantage in phthisical conditions of the larynx.

Trional and Tetronal.—E. Baumann and A. Kast, and W. Barth and Th. Rumpel[359, p.188] have been making experiments with trional and tetronal, two substances possessing properties analogous, therapeutically, to those of sulphonal. Baumann has called the derivatives of this group of reagents disulphones, and finds that those which pass through the organism without decomposition are inactive, such as dimethyl-methan. The intensity of the hypnotic action depends upon the number of ethyl groups contained within the compound. In consequence, a composition containing but 1 molecule of ethyl is less powerful than one containing 2. The following four substances were chosen for study: 1. Dimethyl-sulfon-ethylmethyl-methan. 2. Diethysulfon-methylethyl-methan (sulphonal). 3. Diethysulfon-methylethyl-methan (trional). 4. Diethysulfon-dyethyl-methan (tetronal).

Trional crystallizes in brilliant scales, melting at 76° C. (168.5° F.). The aqueous solution possesses a decidedly bitter flavor. Tetronal crystallizes in brilliant scales, which can easily be prepared by cooling the hot solution. It melts at 85° C. (185° F.), and is soluble in 450 parts of cold water. It possesses a bitter taste, slightly resembling that of camphor. Barth and Rumpel have used tetronal seventy-four times in 30 cases in the same dose as sulphonal. In 65 cases sleep was produced. Even doses as high as 4 grammes (1 drachm) frequently produced no secondary action. Trional produced sleep in 64 cases. These two bodies, therefore, exercise upon man a pronounced hypnotic effect.

Turpentine.—W. H. Gregg,$^{1}_{\text{Jan. 20}}$ has been informed that the inhabitants of the Sandwich Islands are so fond of drink that the native house-painters will use oil of turpentine, for its intoxicating effect, when able to get no other stimulant. They take, at a dose, as much as a pint (½ litre) at a time, and this without injury. From this statement it would appear that the toxic dose of oil of turpentine is larger than is usually supposed.

Uralium.—In a quite recent investigation, Fambroni and Stefani$^{831}_{\text{V. 8, Nos. 1, 2}}$ have found that uralium, which is a combination of chloral and urethan, according to their molecular weights, is an excellent hypnotic in doses of from 2 to 3 grains (0.13 to 0.19 gramme). Sleep comes on about one hour after administration of the drug, and lasts from three to seven hours. No marked serious after-effects were observed; only, in a few patients, a kind of heaviness in the head was experienced on awakening. J. Schmitt and P. Parisot$^{184}_{\text{Dec. 1, '90}}$ have given uralium ninety-five times in 18 different cases of patients suffering from various diseases, such as chronic mania, epileptic dementia, hypochondria, mitral insufficiency, pulmonary tuberculosis, psoriasis, interstitial nephritis, etc. The dose varied from 0.20 gramme to 2.50 grammes ($3\frac{1}{10}$ to $38\frac{3}{4}$ grains), and was given at least two hours after the evening meal. Uralium was found to possess real, but often unreliable, hypnotic action. The sleep produced was calm, but light and intermittent. On account of its disagreeable taste and insolubility it is difficult to administer, and its action on the digestive tract is harmful. The authors, therefore, conclude that as an hypnotic it is inferior to chloral and opium.

Urethan.—T. Sydney Short$^{32}_{\text{July}}$ was satisfied with the use of urethan in 4 cases out of 5 in which he tried the drug.

Vaccinium Myrtilli.—For many years W. Winternitz$^{1001}_{\text{July}}$ has employed a decoction of the blue, fresh or dry, bilberries in the treatment of different forms of diarrhœa, and as an injection in acute and chronic gonorrhœa, with favorable results.

Valerian.—Waliszewski$^{747}_{\text{Mar. 15}}$ has isolated two alkaloids from valerian, giving them the names of chatinine and valerine. He describes the method for the preparation of chatinine, and promises further work in regard to the properties and formula of this new alkaloid. Butte[827 Feb.26] has found that valerian so alters the phenomena of nutrition as to show the absence of sugar in the blood. He has had good results from its use in diabetes.

Vaselin.—P. Carles[188 Apr.5] thinks that we should return to the animal fats as a base for any remedies which we wish to have absorbed by the skin. William Dubreuilh,[188 Apr.12] while agreeing with Carles that it would often be wise to replace vaselin by fats, thinks that vaselin possesses certain advantages, as it will dissolve a number of substances which cannot be used without decomposing them in fats. The author thinks that, while ichthyol prepared with fat has a marked influence upon certain skin-lesions, when dissolved in vaselin its action is purely a superficial one. The fact that vaselin is not absorbed is often of advantage, as it forms a lasting protective to the skin. Adam and Schoumacher[276 Mar.5] have found, from experiments on dogs, that animal fats, as a basis for ointments, are much to be preferred to vaselin. This statement is made from the fact that strychnine, when dissolved in vaselin, was practically of no toxic effect when applied to the skin of a dog, even in enormously large doses.

Venesection.—During the year some very able and interesting articles have been written upon the subject of venesection, notably among which are those of John Shand,[36 Feb.] Robert Lee,[22 May 18] John W. Ogle,[6 May 9] Samuel Wilks,[6 May 23] J. P. Ralls,[647 Feb.] P. H. Pye-Smith,[2 Jan.31] A. A. Barton,[787 Oct.] Manquat,[67 Oct.30] D. B. Van Slyck,[44 Sept.] papers and discussions in the Belgian Royal Academy of Medicine,[52 Nov.15,'90; V.20,2d series,p.1066; V.1,4th series,pp.463,660,705,841,856; V.2,4th series,pp.72,429; V.3, 4th series, pp.112,185,254; V.4,4th series,pp.208,446,517,568] and an editorial[99 Apr.16] reviewing several of the articles above mentioned. None of the papers, however, contain anything particularly new.

Veratrum Viride.—T. G. Stephens[40 Mar.] gives a botanical description, history, physiological action, and therapeutic uses of the American white hellebore. He finds it of the greatest use in the first stage of pneumonia. Aaron C. Ward[19 Mar.14] also praises its use in this disease.

Viburnum Prunifolium.—Joseph Adolphus[199 May] speaks highly of the tincture of viburnum prunifolium, prepared from the fresh bark. He has used it in many cases with good results. Martin de Argenta[454 July] has been able to prevent abortion in 3 cases by the use of the tincture of viburnum prunifolium. He prescribes 30 drops of the alcoholic tincture, every three hours.

Vinegar.—S. J. Bumstead[779, May] finds that a steam-vapor of vinegar is of the greatest value in the treatment of catarrhal croup, membranous croup, and diphtheritic croup. A ready method of volatilizing the vinegar is by placing it in a pan, heating a poker red-hot and plunging it into the liquid.

Water.—The ingestion of large quantities of cold water, to produce antipyresis, is advocated by Cantani,[854, Feb. 1; 19, July 4] who prefers this method to the cold bath. The drinking of the fluid does not give the same result in all kinds of fevers. While in typhus, for instance, the best results were obtained from drinking large amounts of cold water, in typhoid fever the most marked reductions of temperature were produced by introducing into the bowel large enemata of the fluid. In cases of typhus, this method shortened the disease. The injected water reduced the temperature in typhoid to a remarkable degree, and it is asserted that, if the enteroclysms are employed in the beginning, the malady may be aborted in the majority of cases. On the whole, both methods of antipyresis increase the quantity of urine and diminish its specific gravity, and the amount of water required to satisfy the thirst is not so great. This shows that cold water is absorbed in large quantities, cooling the blood and the entire body with more certainty than when other measures are employed. S. J. Daily[1, Jan. 10] says that the hygienic treatment of Wilford Hall, which is sold for $4 to the individual or family, with a pledge of secrecy, consists in the rinsing out of the colon and rectum with a quart (1 litre) to half a gallon (2 litres) of milk-warm water two or three times a week.

Yerba del Carbonero.—The botanical name of this plant is *Bacecharis conferta.* According to A. Martinez,[237, Jan.] it contains acid resin, volatile oil, fat, a yellow coloring matter, gum, tannin, etc. An infusion of the leaves has acted well in coryza.

Yoloxochitl.—According to John M. Maisch,[179, v. 2, p. 222; 237, Jan.] two species of this plant are known in Mexico,—the *Talauma Mexicana* and the *Talauma macrocarpa.* The parts employed are the flowers, the bark, and the fruit. The bark is used as an antiperiodic, the tincture of the fresh leaves as a tonic, the infusion as an antispasmodic, and the wine prepared with the anthers as a remedy against epilepsy.

EXPERIMENTAL THERAPEUTICS.

By HOBART A. HARE, M.D.,
AND
DAVID CERNA, M.D., Ph.D.
PHILADELPHIA.

Absorption of Drugs.—A series of experiments have been made by Yatsbury,[510 Apr.] to determine the rapidity with which drugs are absorbed in different individuals, according to age. The observations were made in healthy male subjects, at ages ranging from 8 to 80 years. The author found, as a general rule, that medicinal substances are absorbed more rapidly in young persons. Thus, in a boy, 8 years of age, weighing 25 kilogrammes (65 pounds), who took 0.15 gramme (2½ grains) of iodide of potassium, iodine was detected in the urine nineteen minutes after the ingestion of the drug. In a man 36 years of age, weighing 66 kilogrammes (166 pounds), under the influence of 0.4 gramme (6 grains) of the same drug, fully thirty-one minutes elapsed before the iodine could be detected in the urine. The absorption of salicylate of sodium took place in boys and young men in about fifteen minutes, in middle-aged persons in twenty minutes, and in old individuals in twenty-five minutes. An exceptional case, however, is reported by the author, in which iodine was detected in the urine of a man 70 years of age *sooner* than in that of an 18-year-old youth.

Acetilphenildrazine.—In a preliminary note G. Mya[589 Apr. 28] states that while the action of pyrodin is to rapidly destroy the red corpuscles, the drug exercises no influence on the activity of the blood-forming organs, especially in the case of perfectly healthy persons. The author found, from a series of experiments, that the period required for the re-establishment of the number of the cells destroyed by the action of pyrodin was about equal, relatively, to that required in the case of loss of blood by extraction.

Alcohol.—E. MacDowel Cosgrave[16 Sept.] reviews the experimental work done by Ridge, Lauder Brunton, Parkes and Wollowicz, B. W. Richardson, Martin, William A. Hammond, Prout, Fife, Vierordt, Hervier and St. Layer, Smith, Perrin and Lehmann, in regard to the action of alcohol in moderate amounts. Contrary to what has been and is supposed, it is found, from all these researches, that small doses of alcohol produce, from the first, a narcotic rather than a stimulating effect. All of these observers, with the exception of Smith, also found that alcohol in small doses diminished the amount of carbon dioxide exhaled.

Spaink,$^{276}_{\text{Oct. 4, '90}}$ in a thorough study, has endeavored to determine the action of ethyl alcohol, when administered for a long time, especially upon the peripheral nerves. The experiments were made on rabbits, the drug being ingested, diluted with water, by means of an œsophageal sound. Immediately after the death of the animals, the auricular, tibial, and pneumogastric nerves were taken out and placed, for hardening purposes, in either Fleming's or Ehrlich's liquid, stained or not, by means of various reagents. He thus determined the degeneration of peripheral nerve-fibres, noticing an especial modification of the axis-cylinder, a spiral twisting of this element, corresponding, probably, to the direction of the degeneration of the fibre. Experiments performed by Miessner$^{4}_{\text{No. 33}}$; $^{36}_{\text{Nov.}}$ on mice and rabbits with allylic alcohol show that this drug produces violent irritation of the mucous membranes, great dilatation of the blood-vessels, with diminution of the blood-pressure and albuminuria. Death is effected by paralysis of the respiration, and is preceded by great dyspnœa and convulsions. Singularly enough, narcosis was not produced by allylic alcohol.

Alkalies.—From a series of experiments upon animals, performed in the laboratory of Lyons, with the object of studying the action of alkalies on the glycogenic function of the liver, E. Dufort$^{3}_{\text{Apr. 2, '90}}$ has arrived at interesting conclusions. His method consisted in causing animals to fast for four days, after which they would be fed, some on meat alone and others on meat and 2 to 5 grains (0.13 to 0.32 gramme) of bicarbonate of sodium, for a period of from eight to fifteen days. They were then killed and the liver carefully examined. From the results Dufort claims to have determined that alkalies increase the quantity of hepatic glycogen, especially in those animals subjected to a diet of meat alone, or to an alimentation poor in hydrocarbons. From a series of observations on a dog with a biliary fistula, W. Nissen[22 Aug.19] has found that such alkalies as bicarbonate of sodium and the chloride and sulphate of the same diminish considerably the secretion of bile. He experimented with Carlsbad salts, which are chiefly made up of substances mentioned. In a dilute form, the salts did not increase the biliary secretion, whereas, in a concentrated solution, they produced a considerable diminution of the normal amount of bile. The most powerful alkali was the acetate of potassium, which caused a decrease in the biliary secretion of as much as 75 per cent.

Aloin.—A chemical and physiological study of this active principle has been made by Meyer.[273 B.28,H.3,4; 2 Apr.25] The drug extracted from the Barbadoes aloes is identical with that taken from the species of Curaçoa and Natal. Aloin occurs in yellowish-white acicular crystals, is soluble in hot water and alcohol, much less so in acetic ether, and sparingly in chloroform, ether, and benzol. From a series of experiments made on animals and men, Meyer found that aloin always acted, with one exception, as a powerful purgative, when given by the mouth or subcutaneously. For hypodermatic uses, a solution in formamide was employed, which has a neutral reaction, and only causes a burning pain for a few moments. It acted in dogs and cats as it did in man, but in a very slow manner. In all free purgation was produced, with no other evil effects; but in rabbits, in which the drug has no such action, the hypodermatic ingestion of aloin was followed by renal inflammation, albuminuria, and death. The purgative action was as slow when administered subcutaneously as when given by the mouth. Natal aloin acted, in cats and dogs, only after very large quantities, but the effects were promptly produced when an alkali was added to the drug in order to decompose it. In man fed on meat exclusively aloin was very active, but not so in persons subjected to a mixed diet. From these latter facts, the conclusion is drawn that aloin in itself has little or no purgative properties, and that, in order to produce its characteristic effects, it must undergo decomposition in the intestines and a new and more active substance be formed. The slowness of its action is thus explained.

Antipyrin.—According to Cesari,[589 Mar.9] antipyrin, in powder or in a weak solution, has no especial local action, but is capable, in strong solution, of producing a more or less marked local anæmia.

In solutions of the strength of 50 per cent. it exercises no action when directly applied to capillary vessels, but when it comes in contact with the mesentery of the frog, or the jugular or the femoral of the rabbit, it produces a more or less marked constriction. In the same strength it soon causes, in the mesentery of the frog, a slowing and, finally, an arrest of the circulation. The same result is obtained in larger vessels if the solution is of the strength of 100 per cent. Mixed with blood, antipyrin exercises a different action, according to the degree of concentration of the solution used. Below a strength of 20 per cent. the drug produces a persistent granite color of the blood, with the formation of small coagula, which disappear on agitation of the liquid. In the strength varying from 30 to 100 per cent. a solution of antipyrin prevents coagulation of the blood at the ordinary temperature of the laboratory; but, placing the liquid at a temperature of 38° C. (100° F.), it acquires the consistency of syrup, and then a few clots may form. Antipyrin does not alter and certainly does not produce a lowering of the arterial pressure. In a recent research, Gottlieb$^{273}_{\text{v.38,H.4}}$ claims to have determined that the reduction of temperature produced by antipyrin is exclusively due to increase of heat-dissipation, while the phenomenon of heat-production remains unaffected. On the other hand, he has observed that the drug in moderate doses produces an increase in heat-production. In normal rabbits 0.50 gramme (8 grains) of antipyrin produced an increased heat-dissipation equivalent to from 10 to 20 per cent. In rabbits upon which cerebral puncture was previously practiced it was increased 55 per cent.

Aristolochia Cymbifera.—This plant, indigenous to Mexico, belongs to the family of Aristolochiæ, and is known under the common name of *guaco.* By the Mexicans it is considered as a specific against the bites of poisonous reptiles. No active principles have been isolated as yet, but, with the aqueous extract of the plant, L. Butte$^{62}_{\text{July 6,'96}}$ instituted a series of experiments, in order to study its physiological action. He found, from the results obtained, that upon the batrachian guaco produces a diminution in cardiac rate and a progressive weakness of the ventricle, and, finally, the heart is arrested in diastole. This arrest takes place, under a dose of 0.50 gramme (8 grains), in from twenty to twenty-five minutes after the injection. In mammals, however, the drug causes a considerable primary increase of the pulse, which is followed by a decrease below the normal. The arterial pressure is always progressively lowered. How the phenomena were brought about was not determined. The general effects of the guaco were those of gastro-intestinal irritation,—nausea, vomiting, and diarrhœa. Albuminuria and a diminution in the quantity of glucose in the blood were likewise produced. The temperature was lowered as much as 3 and 4 degrees, accompanied by a diminution of the amount of carbon dioxide exhaled by the lungs. All these results show that the process of nutrition is seriously interfered with under the action of the drug.

Aspidium.—An elaborate study of the physiological action of male-fern has been made conjointly by J. Prevost and Paul Binet.[197 May 20] The extract was administered in the form of an emulsion with the aid of gum arabic. The conclusions of the authors are as follow: 1. In warm-blooded animals and in man, administration by the stomach rarely produces phenomena of poisoning, on account of the extreme slowness of absorption. 2. As a consequence of hypodermatic or, above all, of intra-peritoneal injections of emulsions of the male-fern, symptoms may be produced which may lead to death by paralysis of the heart and respiration. 3. The dominant symptoms are paralysis and rigidity of different muscles, the muscle of the heart, and the intestines, preceded by general symptoms, such as vomiting, dyspnœa, tremblings, and chills. Paralysis of the heart, however, is the usual cause of death. The cardiac viscus, after death, is found in a condition of firm contraction and non-irritable. The vagi are only affected late in the poisoning. Peristalsis is almost entirely suppressed in the rabbit, cat, guinea-pig, and pigeon. It produces, like cocaine, anæsthesia of the cornea, when locally applied, but no change in the size of the pupil. 4. The urine is usually reduced in amount after the administration of the drug. 5. The central nervous system, which is only secondarily affected in warm-blooded animals, is paralyzed in the frog, the paralysis being spinal in origin. Afterward, paralysis of the nerve-trunks complicate the phenomena of rigidity and loss of muscular power. 6. The oxidizing action of protoplasm on the tincture of guaiac is prevented by the administration of the extract of male-fern. It was also found that leeches immersed in a gum-arabic-solution emulsion of the extract of male-fern exhibited phenomena of paralysis and rigidity.

Atropine.—Our knowledge of the physiological actions of atropine is as yet imperfect, notwithstanding the researches of many observers. The conclusions arrived at so far are contradictory in many points, and it seems that the whole subject needs further and more thorough investigation. During the last year some able papers have appeared upon the actions of this important drug, and a careful examination of them still shows a remarkable divergence of opinion. We shall not endeavor to reconcile these differences, but simply state the most salient points sustained, from which the reader can draw his own individual conclusions. L. Sabbatani,[549, Jan. 4] in a communication to the Società Médica di Bologna, has given the results obtained from a series of experiments made in the Laboratory of Bologna. He first studied the influence of the alkaloid under three different aspects: 1. Its action at the commencement of chloroform narcosis. 2. Its action upon the respiration and the circulation during the whole process of chloroformization. 3. Its influence after both the respiration and heart had ceased through the action of the anæsthetic. The author found, from these investigations, that atropine acted at the beginning, and even in chloroformized animals, as a stimulant to the circulation especially; and that the alkaloid increased the depth of the respiratory movements. While in dogs it did not modify the arterial pressure, it produced an increased pulse-rate, and the reflex stoppage of the respiration was not avoided by the use of atropine. In guinea-pigs, nevertheless, the frequent deaths produced by chloroform narcosis were prevented by the use of the alkaloid. He further found that animals poisoned by chloroform could be resuscitated sooner by the combined use of atropine and artificial respiration than when the latter measure was employed alone. He concludes that atropine should be considered as a prophylactic, not as a curative measure to be employed in chloroformization. He advises the use of 1 milligramme ($\frac{1}{64}$ grain) of the alkaloid before the administration of chloroform. In continuing his investigation in regard to the prolonged use of atropine by repeated injections, the author observed that the increased rapidity of the heart never lasted more than ten minutes, whereas the period of decrease lasted for a considerable time. The primary effects were due to an action of the drug upon the vagi, but the secondary effects, those of the diminution of pulse-rate, were due to an influence exercised upon the cardiac motor ganglia. The alkaloid does not entirely antagonize the action of pilocarpine, but it diminishes the salivary and especially the cutaneous secretion. Finally, the author noticed that under a prolonged use the alkaloid of belladonna loses its effects upon the inhibitory nerve-apparatus of the intestine very rapidly; that is, in about four or five days.

The most thorough contribution recently published on this drug is that of Edward T. Reichert.[112] The investigation was chiefly directed to the study of the action of atropine on the respiration and the circulation. From 7 experiments performed on dogs he found that in 5 increase in the number of respirations was effected some time during the observation, while in 2 the rate was practically unaffected. This increase took place sometimes immediately on the injection of the drug, at others not until several minutes after, while in still others there was, instead of an increase, either no effect at all or a tendency to a gradual decline. These variable results were noticed in the normal animal, but in those whose pneumogastrics were previously severed the alkaloid usually produced an increase in the respiratory rate, showing that the drug powerfully stimulated the respiratory centres. The author, therefore, concludes that belladonna or its active principle cannot be looked upon as a respiratory stimulant in the same sense as ammonia, cocaine, and others, and that atropine, in accordance with the experiments of Bezold and Bloebaum, and with his own, acts upon the respiratory function at the same time in two opposing ways: one (peripheral) tending to diminish and the other (central) tending to increase, the increase or decrease of the respirations in the normal animal depending upon which one of these factors predominates. Reichert, in studying the actions of atropine upon the circulation, finds that the pulse is, similarly, sometimes increased and sometimes diminished under the full action of the drug. From the results of his experiments, the theory that the increase in the pulse-rate is due to an influence exercised on the accelerator nerve-centres certainly appears to be completely exploded. He thinks that if these accelerator centres or nerves were stimulated, we should not expect to observe an increase as often, or, at least, not to the same extent, in those animals where the vagi alone were previously divided, or where the accelerator fibres were excluded by section of the spinal cord. Reichert, therefore, concludes that the pulse-rate is increased by atropine in two ways: by a stimulation of the heart-muscle by small doses, and in larger quantities by a depression of the cardio-inhibitory centres and ganglia. The decrease he likewise attributes to two actions: stimulation of the cardio-inhibitory apparatus and a direct influence upon the heart itself. In regard to the blood-pressure, he finds that the action of atropine is also uncertain, being sometimes increased and sometimes diminished. The increase of the pressure, when it occurs, is attributed especially to a stimulating action upon the centres of the medulla oblongata and the decrease to a depression, centrally and peripherally, especially the former, of the vasomotor system. In criticising Reichert's paper, H. C. Wood[112 Mar.] disbelieves, from a clinical point of view, in the correctness of the physiologist's conclusions, especially in regard to the effects of atropine in human opium poisoning, and also in regard to the symptoms of atropine poisoning. When reference is made to the drug as a respiratory stimulant, Wood states that Reichert contradicts himself when he (Reichert) affirms that "thus, clinical, experimental, and toxicological data demonstrate clearly that atropine cannot be considered a reliable respiratory stimulant;" and on the opposite page the same author states that "the fact that the rate is always increased after section of the pneumogastric nerve is conclusive proof that the drug stimulates the respiratory centres."

Reichert,[112 Apr.] in replying to Wood's criticism, contends that there is no contradiction in his previous statements; that a distinction must be made between *action* and *effect;* that a drug may stimulate the respiratory centres, and yet not be a respiratory stimulant. Atropine, it is true, stimulates the respiratory centres, and yet an increase in the rate and depth of the respiratory movements may be wanting. The author makes a comparison in the case of a drug which may powerfully stimulate the motor centres of the cord, and yet not be a convulsant. He further contends that the effects are inconsistent, and may be in opposite directions. With regard to the theory of stimulation of the accelerator centres and nerves, Reichert holds his own ground, and conveys the impression that such a theory, totally unwarrantable, ought to be discarded from certain text-books, in view of the fact, sustained by the results of recognized researches, that atropine increases the pulse-rate by a direct action on the heart. Apparently in accord, in regard to the action of the drug upon the respiration, Wood and Reichert, as physiologists, are not really entirely so, and the origin of this divergence of opinions lies, we think, on the want of an essential starting-point, viz., What constitutes, physiologically and clinically, a respiratory stimulation? Does this depend upon an increased rate or an increased depth of the respiratory movements? It seems to us that this field of investigation is as yet untouched.

Blood-Serum of the Dog, Action of, Upon the Corpuscular Elements of Human Blood.—An interesting series of experiments, to determine the action of the blood-serum of the dog upon the corpuscular elements of human blood, has been carried on by Charles Luzet,[152, May 29; 80, July] in view of the fact that dog's blood-serum has been recommended recently in the treatment of tuberculosis. When transfusion of blood is performed into an animal from another of a different species, a disorganization of the corpuscular elements, giving rise to thrombosis and hæmoglobinuria, is produced; and, of course, it would be interesting to know, not only from a scientific, but also from a practical point of view, what changes occur in human blood through the influence of dog's blood-serum, and, if any toxic effects are produced, whether these are the same when the serum is injected hypodermatically, thus avoiding the direct contact with the corpuscular elements. The experiments of the author cited consisted in mixing a drop of serum with a drop of human, healthy blood, under the field of the microscope. In every case the results were the same, and it was found that in the first place the red corpuscles lost their power of forming "rouleaux," and had a tendency to run together into compact and irregular masses. On those remaining isolated, the changes were best studied. Within a very short period, these red cells assumed a crenated form, and in about three minutes an exudation would appear on the edges. In five minutes epinated corpuscles were visible, and the exudation was greatly marked. At about the seventeenth minute the reticulum began to be evident, in an extremely fine, open net-work, visible only at the border of the corpuscle, this fibrinous net-work greatly exceeding the normal amount. The white corpuscles, during this time, continued to exhibit their amœboid movements, their nuclei becoming evident at about the twentieth minute. Finally, the viscidity of the corpuscles was increased to a considerable extent. It thus appears that serum of dog's blood acts upon the formed elements of human blood by precipitating the hæmatoblasts and preventing, or at least interfering with, coagulation. These corpuscular changes, then, according to the author, by the production of solid blood-concretions, may possibly give rise to the formation of emboli, in the injections of serum into the human organism; and it is surprising that no such observations have been made, as yet, in the practice of such procedures.

Bromoform.—Monnikendam $\frac{41}{\text{Sept.14}}$; $\frac{121}{\text{Nov.}}$ has carried out experiments, with the object of studying the transformation of bromoform in the economy of warm-blooded animals. His results appear to be opposed to those previously obtained by Issersohn, Zell, and particularly by Binz. Monnikendam administered hypodermatically 1 gramme (15 grains) of bromoform to an animal, causing death within twenty-four hours, and was unable to find any bromine in the urine. Binz thinks that the length of Monnikendam's experiment was too short, and that when the drug is given slowly, so that the animal can be kept alive for two or three days, the presence of bromine in the urine can always be detected. Monnikendam confesses that he has found bromine in the urine, after ingestion of bromide of sodium, during a period of thirteen days. Therefore, there must be some fallacy in the experiments of the latter author, the results of Binz and of other previous investigators remaining intact as to correctness.

Cactina.—The active principle of the *Cereus grandiflora* has been recently isolated, under the name of cactina, by Frederick W. Sultan, and its physiological action has been studied, although not elaborately, by O. M. Myers, $\frac{1}{\text{June 13}}$ who finds that it has no local irritant properties, a solution applied to the conjunctiva producing no effect. In therapeutic doses the drug produces, both in man and animals, an acceleration of the cardiac rate, accompanied by a rise of the arterial pressure. Later, especially under larger quantities, both pressure and pulse are diminished, followed by clonic and tetanic convulsions. The general conclusions are as follow: 1. Cactina increases the musculo-motor energy of the heart, probably by an influence exercised on the intra-cardiac motor and accelerator ganglia, in consequence of which the cardiac impulses become regular and much stronger. 2. The drug elevates the arterial pressure, increasing correspondingly the height and force of the pulse-wave. The pressure is affected by two factors, *i.e.*, increased cardiac action and stimulation of the vasomotor centre at the base of the brain. 3. Cactina increases the reflexes and elevates the general nervous tone, acting similarly to strychnine by directly influencing the spinal cord. The convulsions are of spinal origin, since these occurred even after section of the spinal cord. The subject undoubtedly presents important practical points, and should be experimentally studied somewhat more fully. Boinet and Boyteissier,[3, Sept. 23] in their laboratory experiments, have found that the extract of cactus acts on frogs, the tortoise, and guinea-pigs in a similar manner, producing a notable increase in the energy of the heart. The increased force of the heart was prolonged only after repeated doses. After an injection of from 0.08 to 0.10 gramme (1¼ to 1½ grains) the activity of the heart became slowed and arythmic. The pure alkaloid, injected hypodermatically, in doses of from 0.001 to 0.010 gramme ($\frac{1}{64}$ to 1½ grains), excited the energy of the cardiac contractions, without producing a diminution of the pulse or an irregularity of heart action.

Cantharidin.—Upon the theory of Liebreich that the curative action of cantharidin in inflammatory processes depended on the production by this substance of a transudation of sanguineous microbicidal serum, G. Coen[457, May] made two experiments on rabbits. In the ears of one of them an artificial inflammation was set up. Both rabbits were then subjected to the action of the cantharidate of potassium. The effect of the drug on both animals was negative, as far as the production of the serous exudation is concerned. The rabbits subsequently died from chronic cantharidin poisoning. The autopsy revealed no serous changes. The author, therefore, concludes that a serous exudation produced by the salts of cantharidin, as believed by Liebreich, cannot be accepted as correct.

Capulincillo.—*Rhamnus Humboldtidiana* is known over a large portion of southern Mexico, by the common name of *capulincillo.* According to Fernando Altamirano,[237, Jan.] the pulp of the fruit contains crystallizable sugar, a large amount of glucose, tannin, pectin compounds, etc. From the seeds the same author has been able to extract a yellow oil and a glucoside, which is the active principle. This latter agent, injected subcutaneously to frogs, in doses of 0.20 gramme (3 grains), causes a paralysis of voluntary movement. These effects resemble those produced by curare and erythrina (see "Erythrina Coralloides"). The same drug, however, does not affect dogs in that manner.

Carbon Dioxide.—In a preliminary experimental study Gréhant,[55] has determined that during muscular contraction the production of carbon dioxide and the exhalation by the lungs of the same gas are considerably increased. F. Spallita and L. Finazzi[772, No.3] affirm that carbon dioxide increases the action of the heart by stimulation of the cardiac motor ganglia; and also by paralysis of the peripheral vagi. No marked changes were produced in the arterial pressure in their experiments, even when the rapidity of the heart's beat was most noticeable. With regard to an increased force observed in the cardiac systole, this was the outcome of an action of the drug upon the muscular fibre of the heart.

Castor-Oil.—Notwithstanding the many investigations that have been made upon the subject, the active principle of castor-oil has never been satisfactorily isolated. Many years ago Buchheim stated that it was *ricinoleic acid*, this being found in castor-oil in combination with glycerin, and that in such condition it was unirritating. According to the same author, when the oil was acted upon by the juices of the duodenum, the fat being saponified, the *ricinoleic acid* was set free and it was then that this principle became active, causing purgation. These theories have been contradicted in various ways by later observers, but the recent investigations of Hans Meyer[273, B.28,'90; 2, Jan.10] seem to support Buchheim's statements. Meyer has been able to isolate the pure *ricinoleic acid* and to form a ricinoleate of glycerin, which is neutral fat. Experiments made upon cats and man showed that these two substances possess as active purgative properties as castor-oil. Ricinoleic acid was rapidly absorbed from the intestinal tract, and when given in small doses had no cumulative action. It must be remembered that Buchheim experimented with a derivative of ricinoleic acid, termed by him *ricineloidic acid*, but found that it was inactive. Meyer, however, has shown that when this derivative is given in emulsion it also acts as effectively as castor-oil; that the reason it did not act in the hands of Buchheim was because of the high melting-point of the ricineloidic acid and because of its coherence, which prevents its being broken up and saponified. It seems to us, then, that the active principle of castor-oil has been determined so far, according to the researches of Meyer, which support those of Buchheim; and we have, therefore, in ricinoleic acid, and in its derivative ricineloidic acid, as powerful purgatives as the crude castor-oil.

Celastrus Edulis.—The plant known to the Arabs under the name of *ciat* or *cat* is the *Celastrus edulis* of Forskall, or the *Catha edulis* of Vahl, of the natural order of the Celastraceæ. It resembles the camelia in appearance. What cocaine is to the South American Indian, celastrus is said to be to the Arabs,—the plant being used by these people to enable them to support hunger and fatigue. It is likewise said to possess aphrodisiac properties. The physiological action has not been fully determined, owing to the fact that no active principle has been isolated, notwithstanding the researches of Atfield, Flückiger, Schorlemmer, and Gersch. Recent investigations by Ugolino Mosso,[121 Aug.] of Genoa, have resulted in the isolation of an alkaloid which this observer has termed *celastrine.* In a preliminary study on the physiological effects of the drug, Mosso has employed a neutral solution of the *hydrochlorate of celastrine.* The alkaloid was found to be poisonous to cold-blooded animals. In them it produces, at first, a period of general excitement, followed by one of depression. In small doses it is a decided stimulant to the nervous system. Death is brought on by respiratory failure. In some frogs the cutaneous vessels are markedly dilated after death. Upon the heart of the batrachian, the action of the drug, when locally applied to the viscus, or when administered into the general circulation, is that of an excitant, producing a marked increase in the number of the cardiac pulsations. In warm-blooded animals celastrine appears to have a similar range of action, resembling more or less that of cocaine. In dogs especially the new alkaloid produced, in doses of 0.013 gramme (⅕ grain) per kilo (2½ pounds) of the body-weight, a rise of temperature, widely-dilated pupils, great excitement (as if under the influence of cocaine), a respiration increased in depth but diminished in frequency. The agitation continued for about six hours, the restlessness being particularly marked. The animal reeled about the room continuously, more frequently moving toward the left side, making pivots of his hind legs. These symptoms were accompanied with increased pulse-rate, dribbling of saliva, and a cyanotic condition of the tongue. No staggering, no stumbling over, and no convulsions were noticed, consciousness being preserved to the last. In a single experiment performed by the author with the manometer it was found that the drug, in moderate doses, did not affect the blood-pressure or the respiration; large quantities producing, finally, a steady fall of the pressure. How these phenomena were brought about was not determined. The drug, however, resembles cocaine in that it produces general excitation, stimulation of the brain, and a great increase of temperature; but differs from the latter remedy in that it does not destroy sensibility, nor does it produce convulsions. Under the influence of celastrine the spinal cord, the pneumogastric centres, and the heart may be and are stimulated to a certain extent, but are less powerfully affected than by cocaine.

Chinaldine.—Chinaldine is a methyl-chinoline obtained through the action of glycocoll on a mixture of aniline and dinitrobenzine in the presence of sulphuric acid. It is a colorless liquid, slightly soluble in cold, but readily soluble in hot water. Several salts are formed by it,—chiefly the chlorhydrate, the sulphate, the nitrate, and the acetate, all of which are soluble in water. The physiological action has been studied by Emilio Comesatti,[819 A] who has found that the drug, even in small doses, produces a very decided lowering of the temperature, and that it may be considered a powerful antipyretic. Chinaldine does not seem to modify either the circulation or the respiration, in quantities sufficiently large to depress the bodily temperature. It was found that the drug diminished heat-production by simply mixing with the hæmoglobin of the blood,—preventing the absorption of oxygen and interfering with combustion and thermogenetic processes. The action of chinaldine upon the blood itself appears to be less intense than that of thallin, phenacetine, acetanilide, and similar well-known drugs; for, when brought in contact with the sanguineous fluid, the antipyretic under consideration did not produce met-hæmoglobin, nor the absorption of the characteristic spectroscopic bands. Its mode of action is, therefore, entirely different; the drug does not exercise any influence upon the blood-corpuscles, Chinaldine in large doses produced convulsions, these appearing to be due to an action of the drug upon the cerebro-spinal axis.

Chloral.—The action of this drug upon the kidneys has been studied by Liebreich, but a recent and very good contribution to the study of the same important practical point has been published by Cavazzi.[41 Sept.] Experiments were made on dogs and guinea-pigs, and it was found that when the drug was injected into the abdominal cavity it produced a marked granular degeneration of the epithelium of the convoluted tubules. Prolonged administration of chloral produced swelling of all the renal epithelium, with symptoms of acute parenchymatous nephritis; but, curiously enough, the Malpighian glomerules were never affected, nor was there any change produced in the interstitial connective tissue. These degenerative changes disappeared on the stoppage of the drug. They indicate, according to the author, the dangers that may arise from the employment of the drug in patients with diseased kidneys. David Cerna[112 Nov.] has published a contribution to the study of the actions of chloral upon the circulation. He has especially observed the influence of small doses of the hypnotic, which, according to some investigators, have a tendency to produce a rise of the arterial pressure. From the results obtained in the series of careful experiments, as detailed in his paper, Cerna has found that that primary increase of the pressure, when it occurs, is secondary to changes in the respiration, since it does not take place in animals under the influence of curare. The general tendency of chloral, under all doses, is to produce lowering of the blood-pressure, together with slowing of the pulse. The author arrived at the following conclusions: (1) When locally applied, chloral is a powerful heart-poison; (2) the drug diminishes greatly, and, in sufficiently large quantities, destroys completely the electro-excitability of the cardiac muscle; (3) chloral is a treacherous drug, sometimes producing a sudden paralysis of the heart; (4) the drug diminishes the frequency of the pulse through a double action,—it influences the heart itself, and likewise stimulates the cardio-inhibitory centres; (5) the slight rise sometimes observed in the arterial pressure is secondary to changes in the respiration. Chloral causes a fall of pressure by acting upon the heart, and probably, also, by influencing the pneumogastric centres through the vagi, and by paralyzing the muscle-coats of the arterioles.

Chloralamid.—This new hypnotic has been the subject of a special investigation by H. C. Wood and David Cerna.[826 June] From a series of careful experiments on dogs the authors have arrived at the following conclusions: 1. Chloralamid has a slight local influence, and a large dose tends to produce mucous diarrhœa. 2. It acts more powerfully upon the cerebral cortex than upon any other portion of the nervous system of voluntary life, thereby causing sleep and muscular relaxation; but it is also a feeble spinal depressant. 3. It has a powerful influence upon the respiration, in moderate doses, by a centric action, stimulating the respiratory rate, and probably also increasing the actual amount of air breathed; but in toxic doses causing death by paralysis. 4. Its influence upon the circulation is a feeble one, the changes produced by small doses being probably secondary to other effects of the drug; toxic doses, however, depress the arterial pressure by a direct action either upon the heart or upon the muscle-coats of the arterioles. As will be observed, some of the conclusions reached by Wood and Cerna are opposed to those obtained by previous investigators, notably those of Langgaard, who has experimented on rabbits. Another contribution to the study of the physiological action of this new hypnotic is that of John Gordon.[2 May 16] The conclusions are at variance in some respects with those obtained by Wood and Cerna, the chief one of them being that in reference to the action of the drug upon the respiration. The researches of Gordon led him to conclude as follows: (1) The reflex irritability of the spinal cord was diminished; (2) peripheral sensation was not reduced; (3) on frogs there was no hypnotic action, slowed respiratory and cardiac actions, abolition of reflexes, and subsequent recovery of the normal condition; (4) blood-pressure was slowly reduced with large doses; (5) pulse-rate was not affected; (6) respirations were reduced and finally abolished; (7) the conductivity of motor nerves was destroyed and was not restored by subsequent washing in salt solution; (8) the irritability of muscle-substance was destroyed, and was not restored by subsequent washing in salt solution; (9) the excretion of urea was increased by small doses,—0.3 to 0.6 gramme (4½ to 9 grains),—but was diminished by large doses,—2 to 3 grammes (30 to 46 grains); (10) the excretion of phosphate was diminished with both large and small doses; (11) the excretion of the fluid constituents of the urine was not constantly affected by the smaller doses, but was diminished by the larger doses; (12) reaction of urine was not influenced; (13) color and odor of urine were not affected; (14) no albumen was detected; (15) action of the skin was negative; (16) temperature was not affected; (17) digestion did not appear to be interfered with.

Chloroform.—How chloroform acts on the animal organism to produce its anæsthetic effects has not been fully determined, notwithstanding the previous works of Bernard, Flourens, Bernstein, Hitzig, and Albertoni, which seem to point to the direct and specific action of the drug upon the central nervous system. J. Pohl$^{273}_{\text{[illegible]}}$ has recently investigated the subject anew, and, although his researches are painstaking, a definite conclusion is not reached by him. However, he has found that chloroform, in the first place, acts on the red corpuscles of the blood, and that later, in the course of complete anæsthesia, the brain may contain proportionately more chloroform than the blood. Therefore, he believes that the cerebrum possesses a large number of substances for which the the drug has especial affinity. To this point only the researches of Pohl arrive, but the intimate mechanism of the anæsthetic action is not cleared up. The explanation of the author, that the chloroform has the power of extracting, as it were, from the ganglionic cells of the cerebral cortex a large quantity of material soluble in this liquid, appears to be simply an untenable hypothesis. An important fact is gleaned from this research of Pohl, and that is that the difference between the quantity of chloroform necessary to produce sleep and a lethal dose is not very great.

Chocolate-Fats.—As is well known, the quantity of energy stored in equal amounts of fats, proteids, and carbohydrates is in the ratio of 2.4, 1.8, and 1.0. Fats are digested with the expenditure of a small amount of energy, but carbohydrates, and especially proteids, are slowly digested, causing a very considerable increase in the consumption of oxygen. Bearing this in mind, N. Zuntz$^{116}_{\text{Oct.,'90}}$; $^{2}_{\text{Mar.7}}$ has recently conducted upon himself, and also upon animals, a series of careful experiments, with the object of studying the dietetic value of chocolate-fats, finding that the fats of chocolate can be taken in large quantities without exercising any deleterious influence upon, or even producing any derangement of, the digestive organs. This seems to corroborate the previous statement of von Mering, who found that fat obtained from chocolate, without affecting its peculiar taste, emulsionizes very readily.

Cocaine.—The most valuable research during the past year, regarding the action of cocaine on the circulation, is that contributed by Edward T. Reichert.[234 May] After a careful study of the literature of the subject, he finds much conflicting testimony in the investigations of previous observers, and believes that such testimony is mostly dependent upon differences of dosage, and upon the different species of animals used for experimentation. A series of carefully-conducted experiments was undertaken by Reichert, and the results noted under the influence of different doses. He thus found that very small doses cause a decrease in the frequency of the pulse; small to moderate quantities, an increase; large doses, a transient decrease followed by an increase; and very large amounts, a transient or permanent decrease. With regard to the blood-pressure, he found that generally cocaine produces a rise in the arterial pressure, this being especially of a vasomotor origin. The details of his experiments are carefully studied. The conclusions of the author, sustained throughout his extensive research, and highly interesting, place the whole subject upon a thoroughly scientific basis. These conclusions refer to dogs, the animals exclusively experimented upon in this valuable study, and are as follow: 1. The discrepancies in the testimony offered by different experimenters, in their investigations of the action of cocaine on the circulation, are almost wholly due to variations in the absolute doses employed, and to the individual susceptibility of the animals. 2. The minimal fatal dose, when injected intra-venously in divided doses in the form of a 1-per-cent. solution, varies from 0.004 to 0.03 gramme ($\frac{1}{16}$ to $\frac{1}{2}$ grain) to the kilo (2½ pounds) of body-weight. Owing to the great differences in the sensitiveness of different dogs to the poison, a moderate dose in one animal might prove a small or a large one in another of similar weight. 3. When the full train of effects on the heart-beat is slowly developed by the repeated injections of very small doses—0.001 gramme ($\frac{1}{64}$ grain) to the kilo (2½ pounds) of body-weight—the pulse-rate is at first decreased, then increased, and finally decreased. A single very small dose causes a decrease; a small to a moderate dose, an increase; large doses, a transient decrease, followed by an increase; very large doses, a more or less permanent decrease. The primary decrease, which can only be developed by very small doses, is due to stimulation of the cardio-inhibitory centres; the secondary increase, to a depression of the same centres, and which may be assisted by a similar action on the cardio-inhibitory peripheries; and the final decrease, to a depression either of the accelerator or automatic motor ganglion in the heart. The height of the pulse-curves during these changes is always in inverse relation to the frequency of the beat. 4. The cardio-inhibitory centres are invariably affected, being primarily stimulated and secondarily depressed; but the action on the peripheries is of a very inconstant character, although a primary stimulant action is never manifest; the depressant action is sometimes present to a profound degree very early in the poisoning, and at others absolutely absent up to the time of death. 5. The arterial pressure is always increased, unless it be after large doses, when it may be temporarily diminished, followed by a rise above normal; or, after very large doses, be permanently lowered. The increase may be decided long after the development of the third stage of the actions on the heart, and, therefore, may outlast the period of acceleration of the heart's beat. The increase is chiefly due to a stimulation of the vasomotor centres in the medulla oblongata, to a slight direct stimulation of the vessel-walls, and to the acceleration of the pulse. The final fall of pressure is chiefly dependent upon a depression of the heart, and partly to vasomotor depression. 6. The effects of cocaine in normal and curarized animals are identical, unless, in the latter, the curare has been used to excess. 7. Cocaine is a decided circulatory stimulant.

Gley$^{927}_{\text{July 9}}$; $^{90}_{\text{Aug.}}$ contributes a beautiful and interesting study on the influence of the liver on cocaine, finding, in general, that the alkaloid is less toxic when given by the stomach than when injected hypodermatically, or when directly administered into the circulation. The observer compared the results obtained from injecting the drug into the saphenous vein and into a branch of the vena porta. He noticed that double the amount of cocaine was required to poison a dog if the drug had to pass through the liver. Thus, the lethal dose of cocaine, when injected into the saphenous vein, was 2 centigrammes ($\frac{1}{3}$ grain) per kilogramme ($2\frac{1}{5}$ pounds) of the body-weight, while to produce the same effect 4.23 centigrammes

(¾ grain) were required when injected into the vena porta. When administered into the femoral artery the lethal dose of cocaine is 3.4 centigrammes (½ grain). The rise of temperature and the convulsions were equally marked when the drug was injected into the saphenous vein and the femoral artery; but the elevated temperature was less marked and the convulsions less violent when the alkaloid was administered through the vena porta. It was thus determined, from this research, that the liver acts on cocaine as it does on nicotine, strychnine, hyoscyamine, quinine, and other poisons,—diminishing their toxicity. Researches concerning the action of cocaine upon the circulation have been recently published by Wasserzug, of Warsaw.$^{760}_{Oct.24}$ He finds that cocaine slows the pulse in cold-blooded animals, but this diminution in the cardiac rate only lasts for a short time when small doses are employed. Larger quantities produce a marked slowness of the pulse, followed by a diastolic arrest of the heart. The excitability of the organ is destroyed under toxic doses, and it was found that the trigeminal nerve was also paralyzed. The author noticed that cocaine acted similarly on warm-blooded animals, especially on the carnivorous species. The slowing of the pulse depended on irritation of the vagi, since it was prevented by previous administration of atropine. Large doses not only lessen, but even paralyze the cardiac ganglia. The elevation of the blood-pressure was found to be due to stimulation of the vaso-motor centres, and to an action likewise exercised upon the heart itself.

A study of the physiological action of some of the derivatives of cocaine has been made by E. Poulsson,$^{273}_{B.27,H.4,5,'90}$ who has especially directed his researches to the study of three homologues of the drug,—three ethers derived from it by the substitution of the radicals methyl, ethyl, and propyl, to which the corresponding names of *homomethincocaine*, *homœthincocaine*, and *homopropincocaine* have been given. The experiments were made on frogs, cats, and dogs. The results obtained were similar in nature, and consisted in the production of a local anæsthesia and the general effects of cocaine intoxication. Another point studied by the author was whether cocailbenzoiloxiacetic acid or benzoilhomœcognine possessed the characteristic properties of cocaine; but it was found that 5-per-cent. solutions of the substance itself or of the hydrochlorate, placed upon the tongue, failed to produce any anæsthetic effect whatever; nor did it produce mydriasis when instilled into the eye of animals. The benzoilhomœcognine and the benzoilecgonine have no anæsthetic properties, but further experimentation proved that the alkaline ethers of benzoiloxiacetate and the benzoiloxipropionate of cocaine paralyzed the peripheral ends of the sensory nerves. It was, therefore, shown that etherification played an important part in the production of local anæsthesia by cocaine,—a part which is attributed to the benzoil group. The researches of Poulsson demonstrate that when cocaine is deprived of the alcohol radical, which represents the etherifying principle, the local anæsthetic action and the symptoms of general intoxication of the products thus obtained are modified, and, at the same time, the toxicity of these, especially in regard to mammals, is very much diminished.

Ehrlich $^{69}_{No.\,32,\,'90}$ has made researches similar to those of Poulsson. He poisoned mice with cakes tainted with cocaine, and found that the toxic properties of this drug were more marked than those of the majority of well-known alkaloids, such as morphine, atropine, and pilocarpine. The fatal dose of the drug upon these animals varied from 2 to 3 centigrammes (⅓ to ½ grain). A mouse that took the poison slowly exhibited, at the end of three weeks, all the symptoms of chronic cocainism. In a short time the animal died from general consumption. Post-mortem examination of the animals killed in this manner showed a considerable hypertrophy of the liver, accompanied with a serous infiltration of the organ. Microscopical examination revealed a variety of cellular degeneration, especially the *vacuolary*. The other organs showed no marked changes. In order to find out whether these peculiar hepatic alterations were similarly produced by all the substances containing the molecule of cocaine, he instituted a second series of experiments, employing the benzoilecgonine and the methylecgonine, derived from ecgonine, generally considered as the mother-substance of cocaine. It was found that the toxicity of these substances was about twenty times less powerful than that of cocaine, and that, instead of producing the hepatic changes observed under its action, they caused an atrophy of the liver. On the other hand, the derivatives of cocaine of the carboxilic group, such as cocæthyline, cocopropiline, isopropiline, and cocoisobutyline, exhibited as marked poisonous properties as the cocaine itself, and likewise produced the same hepatic changes upon the animals in which they were used. Ehrlich, finally, concludes, from the results of his investigations, that the hepatic changes are peculiar to these chemical substances of the cocaine group. The *vacuolary* degeneration of the liver must be attributed to an especial affinity of the hepatic cells for the bodies of the chemical series of cocaine. This affinity consists in the fact that the liver-cells absorb into their substance these bodies, before all the other parenchymas, and are thus particularly affected in the manner described. The anæsthetic properties, found only in certain of the bodies of the cocaine series, appear to be due to the presence of certain acid radicals in the molecule of cocaine.

Cresotic Acid.—Charteris[2 Mar.] has made some experiments on rabbits with paracresotic and orthocresotic acids, finding that the fatal dose of the first was about 3 grains (0.20 gramme) per pound weight of the animal; 6 grains (0.40 gramme) produced death in a rabbit weighing 2½ pounds in three hours; while 12 grains (0.78 gramme) gave the same result, in the same period of time, in an animal weighing 3½ pounds. With regard to the orthocresotic acid, the author found that 1 grain (0.065 gramme) per pound of body-weight was sufficient to cause death in from twelve to thirty-six hours; this being preceded by symptoms of paralysis, especially of fore-limbs. The combination of both drugs was then tried, the results indicating an increase in poisonous properties.

Curare.—A most thorough investigation on the pharmacology of curare and its alkaloids was contributed, last year, by Joseph Tillie,[90 Mar.] the subject being treated in such a masterly manner that we cannot but draw largely from this study in order to convey a more thorough knowledge of the true action of this peculiar poison. The conclusions drawn by the author, from his extensive series of carefully-conducted experiments, are well sustained throughout the whole investigation, and it seems to us that the physiological action of curare is almost entirely established by the delicate work of Tillie. Most of the crude specimens of curare, which is a vegetable extract, of variable strength, composition, and origin, contain the alkaloid *curarine*, which in some is associated with a second alkaloid, *curine*. The *first* series of experiments was made with pure *curarine*, and from the results obtained it was found: 1. That in any dose, not exceeding 0.00000028 gramme per gramme (15 grains) of the body-weight, it produced complete paralysis of the motor nerve-endings in male specimens of *Rana esculenta*, and that recovery occurred after a shorter or longer time. 2. That in normal frogs, in which the lower extremities were protected by ligature of all the tissues except the lumbar nerves, after poisoning with curare, stimulation of the lower extremities, on either the poisoned or unpoisoned skin, elicited reflex movements; these reflexes gradually became irregular and were finally lost; but still, when the lumbar nerves were stimulated directly, violent movements of the legs were produced. 3. That when this stage of reflex paralysis of the cord is completely established, division of the cord below the medulla is followed by a rapid disappearance of the depressed reflex activity, and of the apparent sensory and spinal paralysis, since stimulation now of the poisoned or unpoisoned skin is followed by active movements of the protected parts. 4. That previous division of the spinal cord prevents the irregularity, depression, or the disappearance of the reflexes, as no difference can then be noticed between the sensibility of the poisoned and that of the unpoisoned skin. 5. That in a frog with the spinal cord divided below the medulla, an enormous dose of curarine, injected into an extremity which has been isolated by tying all the tissues except the nerves, is followed by paralysis of that part; but slight stimulation of the skin there causes, for several hours, active reflex movements of the rest of the body. 6. That with very large doses—that is, from 50 to 100 times the minimum paralyzing amount—the reflex depression disappears spontaneously, in normal frogs, in from seventy to ninety minutes, and then comes a period of variable duration in which the reflexes are improved, or spontaneous and reflex movements of a spasmodic character occur, and, later, in from three to five hours, the paralysis of the cord is completely established. 7. That the later increased nervous excitability is marked in a few instances, and in about 5 per cent. of the cases a pronounced tetanic condition is observed. 8. That when curarine was applied directly to the cord of a frog, in which previous ligation of the aorta or of the heart was effected, it produced in a short time a tetanic convulsion, even after the slightest stimulation, the tetanus being followed by a complete exhaustion of the cord. 9. That when the alkaloid was injected into the aorta of a frog in which all the vessels, except those supplying the central nervous system, were previously ligated, there was produced, in every experiment, an immediate and violent tetanus.

From the results of this *first* series of experiments the author draws the following logical conclusions: (*a*) Curarine paralyzes the motor nerve-endings. (*b*) The alkaloid has no paralyzing effect on sensory nerves. (*c*) The irregularity and the early depression of the reflexes are due not to an action upon the spinal cord or the sensory nerves, but to an inhibitory influence exercised on the cord by stimulation of the higher centres. (*d*) Curarine has a tetanic action on the spinal cord. The reason why curarine does not produce tetanus in the large majority of cases, when given hypodermatically, is, according to the author, because the circulatory changes produced are such as to prevent the drug from having access to the spinal cord, and because those changes of themselves produce spinal paralysis. If large doses of the alkaloid are administered, there is produced dilatation of the abdominal vessels, and hence accumulation of blood, little or nothing of this fluid entering the empty ventricle, notwithstanding that the heart may continue to beat. The *second* series of experiments was made with 15 different authentic specimens of the crude drug, and it was found that all of them produced effects similar to those of the pure curarine. The *third* series of experiments was undertaken with the bark of *Strychnos toxifera*, obtained from British Guiana, as this bark is supposed to be the chief basis of curare. An infusion of the bark caused the same effects as the crude curare and the curarine, producing a peripheral paralysis and a tetanus of central origin. The author then, in another set of experiments similar to those performed with curarine, studied the effects of *methyl strychnium* (strychnia converted into a methyl-ammonium base), and found that this also produced a paralyzing and a tetanizing action, the motor paralysis being followed, in about an hour, by a well-marked tetanus. In making a comparison between the action of curarine and methyl strychnium, Tillie affirms that (1) strychnine in small doses causes tetanus, but no paralysis of motor nerves; (2) curarine, in similar amounts, produces paralysis of the motor nerve-endings, but no tetanus of the cord; (3) in large quantities strychnia produces complete paralysis of the peripheral motor nerves of unprotected parts and violent tetanus of protected parts; (4) curarine, in a similar manner, causes, in large doses, violent tetanus of protected parts and paralysis of the unprotected parts.

From these observations the author sets forth the conclusion that the difference between the two alkaloidal substances is one of quantity rather than one of quality. In regard to methyl strychnium, it was found that it resembled curarine in its range of paralyzing and tetanizing action. The *sixth* series of experiments was directed to the study of curarine on the blood-pressure, and it was noticed that, in all the animals used,—cats, rabbits, dogs,—a fall was almost immediately produced. The fall also occurred (1) after section of vagi; (2) after a paralyzing dose of atropine; (3) after division of all the cardiac nerves; (4) after section of the spinal cord; (5) after paralysis of the central reflexes by the action of urethane. The cause, therefore, of the fall of pressure must be due to a direct action upon the peripheral nerves or upon the muscles of the blood-vessel walls. It was found, however, that when an injection of barium was made into the circulation a rise of pressure was produced; while, on the other hand, no such action was effected by stimulation of the peripheral nerves. Again, the vasomotor centre was found to be active by the appearance of the "Traube-Hering" curves during the cessation of respiration by the action of the drug. This shows, evidently, that curarine causes a fall of pressure solely by a paralyzing influence exercised on the vasomotor nerves. Small doses of curarine produced on the rabbit a great increase of the reflex excitability of the vasomotor centres, and, under such circumstances, the slightest stimulation caused a great elevation of the pressure,—due, of course, to a vasomotor spasm. These spasms were prevented by large doses of the drug, by section of the cord, by urethane, but *not* by division of the pneumogastrics. The inhibition of the vagi is destroyed by curarine easily in cats, less so in dogs, and with difficulty in rabbits. With regard to pathological changes produced by curarine, an interesting observation was made, namely, that small doses of the alkaloid caused, in a healthy rabbit, the appearance of albumen, blood-pigment, and blood in the urine. Lastly, a study of *curine* was made by the author, who found that that substance had no apparent effect on motor nerves, but that, both in rabbits and frogs, it acted on the heart like veratrine or drugs of the digitalis group. Tillie states, finally, that other arrow-poisons of South America, which generally kill by cardiac failure or paralysis, are made up chiefly of curarine or curine-acting agents, or, perhaps, of a mixture of them.

Gréhant and Quinquaud[8, Apr. 22] have found that, in poisoning by the drug, the muscular power is notably diminished. This result was obtained in the muscles of frogs, dogs, and rabbits. If this is the case, and the observations of the French investigators certainly seem to show it, the action of the poison on the muscular tissue may be considered another factor in the general paralysis produced by curare.

An extensive paper on heat phenomena in curarized animals has been published by Edward T. Reichert[80, Mar., Apr.] during the last year, and, we believe, is the only elaborate research upon the subject produced so far. The whole investigation is so thorough and the results so interesting that the paper has not failed to insure the serious consideration of the scientific observer everywhere. The *first* series of experiments were directed to the study of the effects of the drug on temperature; the *second* series, to the effects of pyrexial agents in animals lightly curarized; the *third* series, to the action on heat production and heat dissipation; the *fourth* series, to the mechanism of the actions of cocaine and caffeine on heat production and heat dissipation. His conclusions, in general, which embrace the chief features of the action of curare on the heat mechanism, are as follow: 1. Doses insufficient to cause motor paralysis may increase the temperature, or primarily increase and secondarily diminish it. 2. Doses just sufficient to abolish voluntary motion act differently in different animals; the temperature from the first may be increased or decreased, or primarily increased and secondarily diminished, or primarily diminished and secondarily increased. Generally, there occurs a notable diminution or a decided increase, the former effect predominating. 3. Repeated doses may cause a progressive lowering of the temperature, or a progressive rise, until death ensues. 4. Large doses invariably diminish the temperature, excepting in certain cases where the animal has been under the influence of curare for some time, or when the temperature exhibits a strong tendency to rise. 5. The increase of temperature is due to an increase of heat production, and the fall to an increase of heat dissipation, which may, to a great or small extent, be aided by a diminution of heat production. Heat dissipation is always increased, but heat production may primarily be increased and secondarily diminished. 6. After doses just sufficient to abolish voluntary motion, heat dissipation is increased, and this generally is the sole factor in causing the fall of temperature, although during the hour immediately following the injection there may be a transient diminution of heat production to aid in the appearance of this phenomenon. 7. The variable effects on temperature are owing to the dull action of curare on the processes of production and dissipation; heat dissipation is always increased, and thus tends to diminish temperature, but heat production may coincidently be increased or diminished, and thus antagonize or even supersede or aid the effect of increased heat dissipation. 8. Cocaine is unable to produce its characteristic effects in animals even lightly curarized. 9. Caffeine is still capable of causing an increase of heat production and temperature, although the effects are somewhat modified. 10. Curare apparently depresses or paralyzes an accelerator heat-centre, leaving intact the automatic heat-centre.

Digitalis.—Bayet$^{276}_{\text{Dec.,'90}}$ has presented to the Société Royale des Sciences Médicales et Naturelles de Bruxelles a unique work on the action of amorphous digitalin upon the cardio-pulmonary circulation. By a delicate and exceedingly patient operation he was able to take simultaneous tracings of both the carotid and pulmonary arteries in an animal under full influence of the drug. He thus found that during the first period the pressure in the carotid was considerably increased, the beats on the left side of the heart being greatly increased in force; in the second period the cardiac rate became rapid and irregular, and suddenly there was a stoppage of the heart's action. On the other hand, during the occurrence of these various phenomena in the left side of the heart, the pressure in the pulmonary artery remained unchanged. This appears to show that, while digitalin increases the work of the left side of the heart, it does not seem to influence the pulmonary vasomotor mechanism. The results, further, apparently lay open a physiological question: Is not the pulmonary circulation, like the rest of the arterial circulation, under the direct influence of the vasomotor system of nerves?

Erythrina Coralloides.—Fernando Altamirano,[179, p.369,'88; 237, Ja.] who has made a special study of this drug, has been able to isolate from the seeds various important principles, among which may be mentioned a peculiar acid called *erythrinic acid*, and two alkaloids, *coralloidine* and *erythroidine.* Erythroidine, according to him, has a paralyzing effect upon the peripheral motor nerves.

Euphorbiaceæ.—Heckel and Boinet,[3, Oct.] who have studied the properties of the juices employed by various tribes for the purpose of poisoning their arrows, affirm that the active principles of such juices are all of a resinous nature and generally belong to plants of the Euphorbiaceæ family. These principles have a uniformity of action, and resemble curare. The juices paralyze the muscular fibre, while the conductibility of nerves and the functions of the heart and nervous system remain intact. Just before the death of an animal poisoned by such agents, direct electrical stimulation of the muscular fibre produces hardly any contractions.

Gastric Secretion and Digestion, Influence of Bitter and Aromatic Substances on.—A great deal of controversy still exists as to the influence which bitter and aromatic substances exercise on digestion and on the gastric secretion. While some observers hold that such drugs stimulate the gastric mucous secretion to a greater extent, thus interfering with the proper digestion of albuminoid matters, others believe that such an increase of the gastric juice does not really exist as a result of the action of bitters. Still, a third class of writers entertain the idea that the bitters do excite the activity of the gastric glands and also that of the walls of the stomach. G. Marcone,[589, Jan. 8] has recently studied the subject from a physiological point of view, and has instituted a series of experiments the results of which are interesting. His conclusions are as follow: 1. Mixing the drug with the food, prepared always in the same manner, (*a*) the period is shortened, (*b*) the quantity of gastric juice is increased, (*c*) the movements of the stomach are more active and more efficient, (*d*) the gastric juice, increased in amount, retains its full digestive power. 2. Introducing the drug into the empty stomach, (*a*) the quantity of gastric juice is increased, (*b*) the juice retains undoubted digestive power. These results were verified by control experiments made with distilled water in place of drugs. 3. In order to ascertain, if possible, whether the action above observed was of local or reflex origin, the vagi were divided in the neck previous to the introduction of the bitter substances, and under these circumstances (*a*) the contents of the stomach did not increase, and (*b*) notwithstanding an increase of acidity the digestive power of the juice was much diminished. Marcone, therefore, concludes that the greater part of the effect of bitters is due to stimulation of the peripheral ends of the pneumogastric in the stomach, whence by a reflex action are produced both the increased secretion and the increased peristalsis.

Hydrastis Canadensis.—The only elaborate research upon this highly interesting drug, during the last year, is that contributed by David Cerna.[80 May.] The author directed his investigation to the study, especially, of *hydrastine*, the principal one of the three alkaloids of golden seal. From the results of the general experiments it was found that the drug produced, in cold-blooded animals, a primary increase of the respiratory movements, followed by a decrease and final cessation of the same; muscular tremblings and rigidity; loss of voluntary movement; clonic and tetanic convulsions; at first increased and afterward decreased reflex excitability; and, lastly, death through failure of the respiration. A similar range of action was observed in warm-blooded animals, but in these other symptoms were noticed. Hydrastine produced in them a primary stimulation, a decrease secondarily, and finally a cessation of the respiratory function; heightened sensibility followed by a fall below normal; salivation; an increased flow of bile; vomiting; hyperperistalsis; loss of voluntary movement; paralysis; clonic and tetanic convulsions, and finally death by respiratory failure. The post-mortem lesions were unimportant, with the exception, perhaps, of a slight congestion of the lungs and a decided biliary extravasation. The author then studied the action of the alkaloid on the different systems separately, and with especial reference to how these various phenomena were brought about.

The only record which has appeared to us extremely curious is that of Experiment 52, in which, after section of the spinal cord, the column of mercury marked 150 millimetres. The pressure is generally quite low after vasomotor paralysis, and yet the writer tells us that in this instance the complete division of the medulla spinalis was verified by post-mortem examination. With this single exception, we think the whole experimental investigation is quite correct, as are the conclusions arrived at by the author, which are as follow: (1) hydrastine is poisonous to both cold- and warm- blooded animals; (2) the minimum fatal dose of the drug in the common frog (*R. esculenta*) is 0.001 gramme ($\frac{1}{64}$ grain) for every 30 grammes (1 ounce) of the animal's weight; (3) the minimum fatal dose of the alkaloid in the dog, by hypodermatic injection, is 0.50 gramme (7½ grains) for every kilogramme (2½ pounds) of the body-weight; (4) hydrastine destroys the irritability of the muscular tissue; (5) very large quantities produce loss of the functional activity of the efferent or sensory nerve-fibres, and also cause anæsthesia, when locally applied; (6) hydrastine, in small amounts, increases reflex activity by stimulating the spinal cord; (7) later in the poisoning, by large quantities, hydrastine diminishes reflex action by stimulating, at first, Setschenow's centre in the medulla oblongata, and afterward abolishes it by paralyzing the spinal cord; (8) the paralysis produced by the drug is due to an action upon the muscles, the motor nerves, and spinal cord; (9) the convulsions of hydrastine are of spinal origin; (10) hydrastine destroys the electro-excitability of the cardiac muscle; (11) the alkaloid, in small doses, produces a primary frequency in the pulse-rate, due, probably, to a stimulating action on the cardiac motor ganglia; (12) in moderate and poisonous amounts it diminishes the number and increases the size of the cardiac beats by an action upon the intra-cardiac ganglia and the heart-muscle itself; (13) hydrastine lowers arterial pressure by a direct action on the heart, and also through a paralyzing influence exercised upon the centric vasomotor system; (14) the drug produces at first an increase and afterward a decrease in the number of the respiratory movements; (15) hydrastine kills by failure of the respiration; (16) the alkaloid lowers bodily temperature, the drug increases peristalsis; (17) in hydrastine poisoning the salivary and the biliary secretions are largely increased, especially the latter; (18) hydrastine, locally applied, produces at first contraction of the pupil, afterward dilatation of the same.

Hydrocyanic Acid.—As is well known, the usual test of hydrocyanic acid is to place a few drops on the eye of an animal, when rapid death ensues. A series of experiments has been instituted by Gréhant,$^{2}_{\text{Mar.}}$ to determine whether the proximity of the eye to the nasal fossa does not allow the poison to pass into the respiratory passages. A glass tube was inserted into the trachea of a dog, the thorax being surrounded by Bert's pneumograph, connected with Marey's leverage tambour, and the writing of the corresponding pen recorded on a revolving cylinder. The time was marked by a metronome. The fluid acid was then applied to the surface of the eye. Two applications were made: the first occupied fifteen seconds, the first effect being produced on the respiration twenty-five seconds afterward; the second application was made one minute after the end of the first, and in fifty-two seconds the animal expired. These results show that the absorption of the acid in the eye produces death from respiratory failure in from two to three minutes, by the passage of the poison into the blood.

Hydrogen.—The direct action of hydrogen sulphide, hydrogen selenide, and hydrogen telluride on the hæmoglobin has been made the subject of a special study by M. A. Arthman Bruère.[277 Oct] It is well known, particularly from the work of previous observers, such as Eulenberg, Hoppe-Seyler, and others, that when hydrogen sulphide is mixed with blood there is formed a chemical compound and an absorption in the spectrum which is characterized by a band between Fraunhofer's lines C and D. Bruère has again investigated this subject, and especially in regard to the action of the selenide and telluride of hydrogen, which has heretofore been overlooked by experimentalists. From the results of this research it appears that the three gases exert an analogous action on the blood-pigment, and, all being powerfully reducing agents, they more or less readily reduce the oxyhæmoglobin. Besides, they further act on the reduced hæmoglobin, giving rise to its decomposition and the formation of compounds, each of which is characterized by an absorption band peculiar to it. The band resulting from the action of the hydrogen sulphide, which was between C and D, persisted for a period of time varying from two to six months. The wave-length of the band was ascertained according to the method of MacMunn, and found to be in its central part .000614 millimetre. The band of the hydrogen selenide, also seen between C and D, never persisted for a longer period than two or four days at most, and its wave-length was .000626 millimetre, being nearer C than that of the hydrogen sulphide. The action of the telluride was somewhat more peculiar. In this case, before the two bands of the oxyhæmoglobin disappear, a third band between B and C appears and is nearer the red end of the spectrum and those of the sulphide and the selenide. When the oxyhæmoglobin becomes entirely reduced, in addition to the band in the red, a single band is observed between D and E, which soon disappears, leaving only the one in the red of the spectrum. It was noticed likewise that the violet, indigo, and blue colors of the spectrum were powerfully absorbed. The band in the red seldom persisted over two days, and its wave-length was found to be 0.000655 millimetre. With regard to the nature of the compounds formed by the action of the three gases, nothing definite could be ascertained, but the fact remains that the same general form of spectrum persists for all of them; that is, a single band to the left of D. In conclusion, following the statements of the author, "It is also worthy of notice that the characteristic band shifts toward the red end of the spectrum, as the molecular weights of the compound increase. So that the band of the compound with the highest molecular weight, the compound formed by H_2Te, lies nearest the red end; the band of the compound with the lowest molecular weight, that formed by H_2S, is farthest from the red end; and the band of the compound formed by H_2Se holds an intermediate position in the spectrum;" and that, finally, "The single absorption band characteristic of blood treated outside the body with hydrogen sulphide, hydrogen selenide, and hydrogen telluride, is of no medico-legal value, inasmuch as in poisoning by those gases death supervenes before they have had time to exert their special action on the blood-pigment."

Hydrogen, Sulphuretted.—An experimental research upon the physiological action of sulphuretted hydrogen has been undertaken by F. Spallita and L. Finazzi.[772 No.2] They have found that the gas diminishes and finally arrests the action of the heart. This diminution of the pulse and final paralysis of the organ is due, according to the authors, to stimulation of the peripheral pneumogastric centres, as proved also by the diastole which was always observed under the toxic influence of the sulphuretted hydrogen. No such result was obtained in a previously atropinized animal; under these circumstances the gas was relatively powerless.

Iron.—By what channels principally, and in what proportions, iron is eliminated from the system has not been satisfactorily determined. Even among the highest authorities on the subject there is a diversity of opinion. Two of the most recent researches are particularly worthy of notice, although the subject still presents a wide field for further investigation. Several years ago, Hamburg, from a series of experiments, determined that iron is eliminated by the fæces especially, though some of it may be found in the urine and even traces in the bile. Thus, in the course of thirteen days, a dog was given 180 milligrammes ($2\frac{4}{5}$ grains) of iron, and it was found that during the same period, 136.3 milligrammes (2 grains) of the drug were eliminated by the fæces, 38.4 milligrammes ($\frac{1}{2}$ grain) by the urine, and only 1.8 milligramme ($\frac{1}{32}$ grain) by the bile; so that, from these results, the iron in the bile may be regarded as an index of the hæmatolytic action of the liver. More recently, however, Dastre,$^{80}_{\text{July}}$ has found that the amount of iron excreted by the liver is quite variable, but that the mean percentage is .94 of the dry residue, the hepatic iron depending more on the blood formation or blood destruction in the liver than on the alimentary conditions. In regard to the proportionate amount of iron excreted, Dastre says that a dog weighing 25 kilos (55 pounds) eliminates by the bile, in twenty-four hours, from 2.34 to 0.9 milligrammes per kilo ($2\frac{1}{2}$ pounds) of body-weight.

A more elaborate research on the study of the elimination of iron is that of R. Gottlieb.$^{83}_{\text{B.15,H.5}}$; $^{90}_{\text{Aug.}}$ The experiments were carefully performed, and, from the results obtained, it would appear, in general, that less iron is excreted during the administration of the drug than before. During nine days, an animal, without the drug, eliminated by the urine 9 milligrammes ($\frac{1}{8}$ grain) of iron; while in nine other days, during which the iron was ingested, only 6.3 milligrammes ($\frac{1}{10}$ grain) could be recovered from the urine. The author, therefore, attributes this phenomenon to the retention of the iron by the tissues, and not by the blood; as, if this were the case, poisonous symptoms would follow. To determine by what parts of the system the drug was chiefly eliminated, he injected, for two consecutive days, into the saphenous vein, a sufficient amount of iron, without producing poisonous symptoms, and then compared the results thus obtained with those in an animal that had not taken the iron. The author found (1) that, after intravenous injections, a considerable amount of the metal is excreted into the intestinal tract; (2) that, after protracted administration of iron in this manner, the largest amount is found in the liver. Apart from the amount of blood it contains, the hepatic organ seemed to have an especial power of retaining iron. This was further proved by the fact, according to the author, that before analysis the livers were entirely deprived of their blood, and even then the amount of iron was from 20 to 65 per cent. higher in those of dogs that had taken iron than in those of animals that had received no drug. Iron, therefore, like other metals, such as lead, mercury, and copper, accumulates in the liver, but how it passes into the intestines was not clearly demonstrated, for Gottlieb found but a slight trace of the drug in the bile of injected animals; and he further noticed that more iron is found in the liver of fasting animals than in that of dogs well fed. This corroborates the observations of Bidder and Schmidt. Gottlieb believes that when iron is taken into the circulation it is first deposited in the liver, and then gradually passes into the blood, but that the epithelial lining of the intestinal tract possesses the property of excreting it into the intestines, and in this opinion the writer is sustained by the fact that the intestinal walls of animals injected with the metal yielded a larger proportion of iron than those of animals in the normal condition. He further states that the mucous membrane of the stomach likewise excretes iron, and in this method of excretion the drug resembles manganese and bismuth. The reason why iron is poisonous when injected into the circulation, and not so when given by the mouth, is because, in the first instance, the metal does not all reach the liver at once, the part remaining in the blood acting as a deleterious agent; while, in the second instance, the iron is first absorbed by the intestines, then taken to the liver, there retained, and from there enters the system gradually.

Kava-kava.—No active principle has yet been isolated from this drug, although bodies have been described, such as *kavahin*, *yangonin*, and alpha-kava, or *lewinin*. The effects of these various substances are similar to those produced by the crude drug, which is the *Piper methysticum* of the Piperaceæ family, cultivated in the Fiji, Hawaiian, and other islands. The most recent research upon the physiological action of this plant is that published by David Cerna,[80 Jan.] who, from a series of carefully conducted experiments, found that small or moderate doses stimulate the nervous system, larger quantities depressing this and the circulation, finally producing death through failure of the respiration or by cardiac paralysis. Cerna employed in his experiments the fluid extract of the drug, and from a study of the action of kava-kava on the different systems he concludes as follows: 1. Kava-kava produces general anæsthesia, and is especially a powerful local anæsthetic. 2. The drug diminishes, and finally destroys, the function of the afferent nerves, by affecting their peripheral ends. 3. Kava-kava diminishes, and eventually abolishes, reflex action by influencing the spinal cord, and also probably the sensory nerves. 4. The paralysis produced by kava-kava is of spinal origin, and is due to an action upon the cord. 5. Kava-kava, while increasing the force of the heart, diminishes the number of pulsations by stimulating the cardio-inhibitory centres and ganglia, chiefly the former. 6. The drug lowers the arterial pressure through an action upon the vagi. It afterward elevates it, however, especially after previous division of the pneumogastrics, by a direct action on the heart. 7. Kava-kava at first stimulates, afterward depresses, and finally paralyzes the respiration. The primary stimulation is due to excitation of the pulmonary peripheries of the vagi; the latter effect to an influence exercised on the respiratory centres of the medulla oblongata; 8. Kava-kava, in small doses, increases slightly, and in large quantities diminishes, the bodily temperature. 9. The drug increases notably the salivary secretion.

Lobelia. — Fernando Altamirano[792, Apr.] has studied the physiological action of a species of lobelia, the *laxiflora*, and finds that, in general, the drug hypodermatically administered causes vomiting, but no other gastro-intestinal symptoms. The respiration and both the cardiac rate and the blood-pressure are increased. When an intra-venous injection of 4.50 grammes (1 drachm 8 grains) is given to a medium-sized dog, there is produced violent vomiting, followed by loss of voluntary movements; reflex action is then increased, and soon after there come convulsions, opisthotonos, dilatation of the pupil, and, lastly, a slight external strabismus. *Pari passu* with a diminution of the cardiac rate and a depression of the respiration, under large doses, there comes a loss of general sensibility. In very large quantities lobelia causes liquid intestinal discharges, and, when locally applied, is an irritant producing a pustular eruption. How these different phenomena were brought about was not determined.

Methylal.—E. Marandon de Montyel$^{152}_{\text{Feb. 28}}$ has published the results of an experimental research in regard to the physiological action of methylal. He finds that the drug can be administered, without producing any deleterious effects, in doses of 12 grammes (3 drachms); that it acts upon the heart, diminishing the rate of the pulse and causing a decided increase of the arterial pressure. Methylal is likewise a depressant of the respiratory function, and so acts upon the renal secretion as to produce a true polyuria, during the first hours of administration, and, on the contrary, an incontinence of urine, especially in nervous individuals. In sufficiently large doses, it produces a sense of warmth in the stomach, followed by nausea and vomiting. Under the influence of the drug the bodily temperature is diminished, but neither the reflexes nor the general sensibility is affected. It is to be regretted, however, that the author did not determine the manner in which these different phenomena were produced.

Morphine.—While studying the production of anæsthesia upon small animals L. Guinard$^{3}_{\text{Dec. 31, '90}}$ has made a peculiar observation in regard to the action of morphine upon rats. The drug does not, as on dogs, produce sleep and a narcotic prostration. On the contrary, morphine produces, in the feline species, symptoms of marked excitation, these being proportionate to the size of the doses employed; and if the quantity is sufficiently large, convulsions occur before death. These results were obtained by the author in 19 experiments. The drug was used hypodermatically and intravenously, in doses varying from 0.0004 to 0.09 gramme ($\frac{1}{200}$ to 1½ grains) per kilogramme (2½ pounds) of the body-weight. His conclusions are as follow: (1) Morphine always produces, in all doses, in cats, a stage of excitement followed by convulsions; (2) the action upon these animals is such that the nerve-centres, no matter how excited they may be through the influence of the drug, easily yield to the action of anæsthetics; (3) this marked excitation, so constant in peculiarly nervous animals, may closely resemble the same phenomena observed in human subjects, especially in women, in some of whom morphine never produces a calmative effect. In all the observations made by the writer there was never noticed, in the cat, the least sign of morphinic stupor, *Nickel.*—John C. McKendrick and William Snodgrass,[1 Jun.] have undertaken an experimental study of the carbon monoxide of nickel, and, from the results of their investigations, they have summarized the following conclusions: 1. $Ni(CO)_4$ is a powerful poison when injected subcutaneously. 2. The vapor of $Ni(CO)_4$ in air, even to the extent of less than 0.5 per cent., is dangerous. 3. The symptoms are those of a respiratory poison, and are similar to those caused by carbonic oxide. 4. The spectrum of the blood of an animal poisoned by $Ni(CO)_4$ is that of carbonic-oxide hæmoglobin, and is not reduced by sulphide of ammonium. 5. When the substance is injected subcutaneously, it is probably, in part, dissociated in the tissues, as there is evidence of the existence of nickel in these tissues; but the nickel also finds its way into the blood, and is found there. 6. The substance produces a remarkably prolonged fall of temperature, even when given in small quantities. This may be accounted for by the hæmoglobin being prevented, to a large extent, from supplying the tissues with oxygen. Nico, as we may, for convenience, term this substance, makes it possible to give graduated doses of carbonic oxide, and thus reduce temperature by directly interfering with the respiratory exchanges occurring in the tissues. The objections to its use as an antipyretic are that, owing to its poisonous properties, it is difficult to inject it subcutaneously in sufficiently small doses; while it is not easy to obtain a solution in any menstruum in which decomposition will not take place. If a convenient method of dissolving it could be devised, $Ni(CO)_4$ might become a valuable antipyretic, the *modus operandi* of which is intelligible.

Nicotine.—The only study worthy of notice made of this drug, during the last year, is that of Wertheimer and Colas,[996 May] who have elaborately investigated the action of the drug on the heart and the circulation. From the results of their researches they find that: 1. As regards the heart, destruction of the accelerator nerves, or of the extrinsic accelerator centres, does not prevent the production of increased frequency in the cardiac action, as a result of the two phases of poisoning with nicotine; as a consequence, the action of the poison is exercised exclusively on the intrinsic ganglia. 2. The increased excitability of the cardiac muscle in poisoning by nicotine is evidenced by the fact that excitation of the apex leads to the production of a series of pulsations, and not a single beat only. 3. As regards the action of nicotine on the vascular system, when a simultaneous registry is made of the general blood-pressure and of the volume of one of the abdominal organs, the spleen or the kidneys, it is found that the former diminishes at the moment where the latter increases. This state of affairs is followed by a second phase, during which the fall of pressure coincides with an increase in the volume of the organ. These two successive modifications of pressure are independent, the first being dependent on the constriction of the small splanchnic vessels, the second on their relaxation. While the blood-pressure is increasing, the mucous membrane of the lips and of the tongue becomes the seat of an intense congestion from the excitation of the vaso-dilators of that region. After complete destruction of the spinal cord, the injection of nicotine still determines an increase of blood-pressure, which may amount to 12 centimetres. Further, if the nerves of one side of the tongue or lips are divided, the congestion of these parts produced by nicotine is quite as marked as in the normal side. The authors, therefore, believe, from the results of this experiment, that there exist purely peripheral vaso-dilator and vaso-constrictor ganglia.

On Cerebral Thermometry.— Fasola,[505 No.11.'90] using a thermo-electric pile and the galvanometer, has studied, in the Physiological Institute of Pavia, the increase of temperature in given regions of the surface of the cranium during the time speech was being exercised. He has ascertained that the action of talking determines a temporary rise of heat in the antero-lateral region of the head, corresponding to the cortical centre indicated by Broca. This rise of temperature was sometimes on one side, sometimes on both sides. The temperature on the left side was not always higher than on the right, and sometimes it was equal on both sides. Intense mental exertion, if short, did not produce a rise of temperature; but if it were prolonged, there was a slow and gradual rise of heat on the same side in which it was noticed, in the same individual, during the action of speaking. Fasola considers that this rise of temperature observed on the scalp indicates that there is a more intense variation in the deeper organ of the brain. These inquiries of Fasola confirm the observations of Dario Maragliano and Seppilli. On the other hand, Marcacci and Frank have insisted that changes in temperature in the brain could not be conducted to the surface so as to be indicated by the thermometer. The experiments of Frank show that, in circulating hot water in a coil through the brain of the dog, there was no observable increase of temperature on the surface of the head; but it was impossible to make such on experiment without causing a great derangement in the vascular innervation of the head.

Most people will think that the observations of Fasola are a real confirmation of the former results of cerebral thermometry, since they indicate a higher temperature in the very points which might be expected to be put into function during the act of speaking.

On the Destruction of Glucose in the Blood by the Action of Certain Drugs, especially the Extract of Valerian.—Butte$^{3}_{\text{Feb. 18}}$ has endeavored to determine whether the use of any drugs will influence the glucose in the blood, and from the results obtained gives the following *résumé*: 1. Addition of sodium bicarbonate, or morphine, to freshly-drawn blood has the effect of slowing this destruction. 2. Curare, on the other hand, hastens the change. 3. Addition of extract of valerian diminishes very considerably the destructive power. 4. Normal blood will rapidly cause disappearance of glucose, which may be added to it. 5. Extract of valerian injected into the vessels acts in the same way as in the experiments *in vitro*; it delays the destruction of the glucose contained in the blood. Valerian would thus appear to have a delaying influence on certain phenomena of nutrition, and admitting, as has been stated, that this drug is of much benefit in diabetes, this would tend to show that diabetes is not one of the diseases due to impairment of nutrition.

On the Influence of Restricted Ingestion of Liquids on the Mineral Metabolism and Assimilation.—Mikhail I. Manotzkoff$^{2005}_{\text{No. 7, p. 61}}$ has experimentally studied the effects of a relatively dry diet on the assimilation and metamorphosis of chlorine, phosphorus, sulphur, calcium, and magnesium in healthy individuals. The experiments were made on 6 young men from 21 to 24 years of age, the observations embracing fifteen successive days, subdivided into three stages of equal length. During the first and third periods the subjects were receiving an average daily diet of 2440 grammes (5¼ pounds) of liquids, such as milk, tea, and water. During the middle or second period the daily allowance was reduced to 823 grammes (1⅘ pounds).

Other articles of diet, comprising butter, bread, roast beef, sugar, and salt were given in identical amounts during the three periods. The results, which are highly interesting, may be condensed as follows: 1. With the dry dietetic regimen, both mineral metabolism and assimilation are distinctly increased, as shown by this table, in which the surplus in average percentage is given:—

NaCl	15	7.5
P_2O_5	8.0	8.0
SO_3	11.7	16.1
CaO	11.3	13.8
MgO	13.6	21.5

These results and other phenomena are further explained by the author thus: "It is highly probable that such increase is dependent, primarily, upon inspissation of the blood, the latter tending to restore its normal proportion of water by way of an intensified absorption of fluids from the gastro-intestinal tracts; the percentage relation between water voided through the kidneys and ingested water invariably increases, the surplus averaging 20.2 per cent.; on the whole, the diminished ingestion of fluids (which plays so important a part in Oertel's method of treatment of cardiac and certain other affections) affords an excellent means for promoting the elimination from the system both of water and mineral constituents; such dietetic restriction, however, is accompanied by a train of unpleasant subjective and objective phenomena. Thus, as a rule, even about the first evening of the reduced ingestion of liquids, the subject begins to experience thirst, which steadily increases to a troublesome extent. The appetite at the same time distinctly fails, while on a third or, more frequently, a fourth day there appear physical lassitude and mental languor, with aversion to work. Moreover defecation becomes rather difficult (on account of dryness of fæces)."

On the Nutrition of Muscle.—It is generally held that solutions of myosine, syntonin, peptone, casein, egg-albumen, and glycogen are incapable of restoring to activity the *washed-out* heart of a frog, and that serum-albumen is the only known nutritive proteid. The subject has been studied by various observers, notably by Kronecker, Ringer, and others, but the results are at variance in some respects. To what substance or substances the restoring power is due, the most important question at issue, has not been exactly determined. Working upon this interesting matter, Julia Brinck $^{2}_{\text{July 25}}$ has instituted a series of carefully conducted experiments, with especial reference to the nutritive action of various proteid fluids upon skeletal muscles, and from the results obtained she has arrived at the following conclusions: (1) skeletal muscle, like cardiac muscle, is "nourished" by serum-albumen; (2) skeletal muscle, like cardiac muscle, is *not* "nourished" by egg-albumen, peptone, albumose, glycogen, creatin, creatinin, Ringer's fluids, nor Liebig's extract. In regard to this negative statement, the authoress adds expressly that its accuracy turns upon the definition of the words "washed out" and "nutritive." She goes on to say that, unless the muscular tissue has lost all excitability, it is not possible to test the "nutritive" action of a fluid; but she does not deny, however, that, this preliminary condition failing, many salts and other substances may exercise "stimulative" effects. These effects are, in her opinion, not sufficient evidence of nutritive action.

Opium.—The recent researches of W. Spitzer $^{20}_{\text{B.123,H.3}}$ in regard to the action of opium and morphine upon the intestine are interesting, and indicate that both substances diminish the activity of peristaltic movements, this phenomenon being due partly to excitation of the inhibitory centres and partly, although in a less pronounced manner, to an action upon the sensibility of the mucous membrane. The action of opium upon the intestines, when subcutaneously injected, depends on the amount of morphine which it contains. If administered by the mouth, the action is more marked than that of a corresponding dose of morphine. The other alkaloids, such as codeine, papaverine, narcotine and narceine, only gave negative results as regards their influence on the intestine. When combined with morphine, and administered hypodermatically, they did not increase the action of this latter alkaloid.

Pancreatic and Rennet Extracts, Action of, on Casein.—In a study of the subject Edkins $^{2}_{\text{July 18}}$ has endeavored to show the changes produced in casein by the action of pancreatic and rennet extracts, and from the results obtained, in a series of experiments, the following conclusions are reached: 1. There exists in pancreatic extracts a ferment which has the power of causing an alteration of the casein of milk, and this may be made manifest by a clotting of the milk. The action of the ferment may be to some extent differentiated from the proteolytic ferment, and it appears quite comparable to the recent ferment of gastric extracts. 2. The presence of neutral salts has a considerable influence in determining the clotting of milk by this change in the casein. 3. Though no clotting occurs, yet the change in the casein may be recognized by the application of heat, which causes heat coagulation, or by the addition of an equal bulk of saturated solution of sodium chloride, which causes a precipitation of the altered casein. 4. If minimal quantities of calves' rennet be added to milk, the changes referred to in 3 will occur, and the milk will resemble that treated with specimens of pancreatic extracts to some extent.

Parsley.—From an experimental study of the principles of parsley, L. E. Mourgues and J. V. Laborde,$^{164}_{\text{Jan.8,15,22}}$ have obtained important results. The experiments were made chiefly with *apiol* and *cariol* and some with the *apioline* of Chapoteaut. Of all these three substances, the apiol was the most active. Cariol produced uterine vascular contractions, excitability, convulsions, paralysis, and finally death through respiratory failure. Apiol, similarly, caused excitability of the motor nervous system, increased reflexes, convulsions, general paralysis, muscular tremors, salivation, some dilatation of the pupil, and, finally, death by asphyxia. Upon the circulation, both apiol and cariol, with few exceptions, produced identical effects. One cubic centimetre (16 minims) of apiol, intra-venously injected, caused an almost immediate rise of the arterial pressure, this phenomenon being due to increased cardiac action and also to stimulation of the vasomotor centres in the medulla oblongata. Large doses produced a lowering of the pressure. Cariol acted in a similar manner, but its influence was less marked. Identical phenomena upon the muscular and nervous systems—that is, those of excitability—are produced by both drugs; but the general excitability and the convulsions predominate under the influence of cariol. It appears, from these researches, that the actions of both principles are chiefly confined to the reflex and vasomotor centres.

Phenol.—Zwaardemaker $^{3}_{\text{Mar.11}}$ calls attention to the fact that cats and rats are extremely susceptible to the action of carbolic acid. He has observed that doses of the drug, so small as not to produce any effect upon dogs or rabbits, invariably kill rats and cats, death in these animals (which is due to respiratory failure) being preceded by a period of convulsions, which lasts for several hours. The convulsions are of a clonic character, and are especially marked on the muscles of the head and trunk. The author does not believe that these symptoms are due to a slow elimination, but most probably to an irritability of the nerve-centres, as in the case of morphia, which produces on the same animals, according to Guinard, similar phenomena of excitability. From a series of experiments with camphorated phenol, Combemale and François,$^{31}_{\text{June 5}}$ have arrived at these conclusions: 1. Upon dogs and rabbits the drug is fatal in the proportion of 0.60 gramme (1 grain) per kilogramme ($2\frac{1}{2}$ pounds) of the body-weight. 2. The toxicity of the combination is due to the carbolic acid and to the camphor; the association of both substances does not in any way modify the poisonous properties of the phenic acid. In the mixture, therefore, the part played by the camphor is that of a vehicle.

Podophyllum.—*Podophyllotoxin*, which, according to the early investigations of Podwyssotzki, is the active principle of the resin of podophyllum, has been recently obtained in a pure, crystalline form, and is the subject of a series of careful experiments by Neuberger.$^{273}_{\text{B.28,II.1}}$; $^{2}_{\text{Jan.10}}$ This crystalline podophyllotoxin, of a snow-white appearance, is sparingly soluble in water, but very soluble in alcohol, the solution of which exhibits an intensely bitter taste. Frogs and rabbits were found by Neuberger to be but little affected by the drug. In the batrachian the administration of 0.01 gramme ($\frac{1}{6}$ grain), in emulsion, produced some muscular rigidity and death in the course of three to four days. In these cases, the intestines were sometimes found in a state of hyperæmia. When given to rabbits hypodermatically, it only produced a local irritation, and by the mouth the action of the drug was uncertain. Cats, however, showed an especial susceptibility to the influence of podophyllotoxin. An injection of 0.001 gramme ($\frac{1}{64}$ grain) produced death in a cat in three days. In from two to four hours after the administration, there occurred violent vomiting, the matters expelled consisting of food mixed with bile and mucus, followed by severe diarrhœa. The symptoms, in the case of an empty stomach, usually produced death. The temperature was lowered. These same effects were observed in hens, pigeons, and dogs. Post-mortem examination revealed marked signs of a gastro-intestinal irritation. The liver and kidneys were found hyperæmic; the gall-bladder full and swollen. There was marked glomerulo-nephritis and a commencing inflammation of the tubules. Supposing, from the appearance of the gall-bladder and the extreme redness at the opening of the bile-ducts, that the podophyllotoxin might be excreted from the blood by the liver, the author made 3 experiments upon dogs, whose common biliary ducts were previously tied, and giving the drug subcutaneously. The results were precisely the same, and exactly similar ones were obtained when the podophyllotoxin was intra-venously injected; and, as there was no action exercised on the nervous system, circulation, or the respiration until just before death, the author concludes that the drug acts simply as an irritant. The purgative effects are produced when the drug is extracted from the blood by the intestinal canal, through a local action, and, in a similar manner, causes irritation of the kidneys on its being eliminated by these organs.

Potassium Bromide.—According to a note communicated to the Société de Biologie, Féré and Herbert,$^{3}_{\text{Oct.21}}$ in a recent research regarding the cumulation of bromide of potassium in the organism, have obtained results opposed to those of Cazeneuve and Wolf. Féré and Herbert assert that the drug cumulates in the liver in considerably larger quantities than it does in the cerebral mass.

Rubidium-Ammonium Bromide.—Tausk and Vas$^{41}_{\text{Aug.3;}}\,^{80}_{\text{Oct.}}$ have published the results obtained from a series of experiments with this drug. In the frog, the smallest quantity to produce any effect was $\frac{1}{3}$ grain (0.021 gramme). Doses of 5 grains (0.32 gramme) gave rise to fibrillary contraction at the point of injection, followed by general muscular tremors and a short period of convulsions; gradually the batrachian evinced symptoms of paralysis, loss of sensibility, especially of the hind extremities, followed in twenty minutes by complete anæsthesia of the whole body, and by death in forty minutes. In mammals similar symptoms were observed. In a rabbit 15 grains (0.97 gramme) produced convulsions, which soon gave place to anæsthesia and general relaxation, first of the fore and then of the hind extremities, accompanied by a rapid heart-beat, slowed respiration, and dilated pupils. The actions of the drug are, therefore, local and general; upon the cornea and mucous membrane of the mouth the anæsthesia was marked. The authors state that upon rabbits especially the rubidium-ammonium bromide acts on the respiratory centre, producing the characteristic periodical breathing described by Biot. The spinal reflexes and the heart's action, which are at first increased, are afterward diminished and finally abolished. Temperature and body-weight are also said to be steadily diminished under the influence of the drug.

Saline Baths on the Assimilation of Food-Fats.—The assimilation of food-fats under the influence of saline baths has been the subject of an experimental study by J. Afanasy Slutchevsky.[90 Aug] The investigation was made on 5 healthy men, each individual being under observation for twelve consecutive days, during three equally long periods. Each person was placed, three or four hours after dinner, in a bath of a half-hour's duration, this consisting of 1-per-cent. solution of kitchen-salt at 35° C. (95° F.) The diet consisted of boiled lean meat, broth, bread, butter, raw milk, tea, with sugar and water. An analysis was then made, directed especially to the extraction of neutral fats and fatty acids from the fæcal matter; isolation of fatty acids from fæcal soaps, and dissolution of the acids in alcohol; saponification of the fats and acids by means of baryta; purification of the baryta precipitates, freeing them from cholic acid and cholesterin by means of washing out; decomposition of the baryta soaps and extraction of fatty acids therefrom. The conclusions at which the author arrived, and which are well sustained throughout the whole investigation, are as follow: 1. During the bath period the assimilation of food-fats invariably decreases, the diminution oscillating between 0.662 and 3.624 per cent. The depression persists during the after-period, the assimilation usually (in 3 out of 5 cases) even sinking still further, from 0.718 to 2.997 per cent. against the bath stage. 2. Pulmonary and cutaneous aqueous losses always fairly markedly (from 4 to 15 per cent.). In a large majority of cases (in 4 out of 5) during the after-bath stage their daily amount rises still further. 3. The daily quantity of the urine sinks correspondingly (from 4 to 15 per cent.), the fall continuing during the after-bath period. 4. During the bath stage the bodily weight, as a rule, somewhat sinks, but during the after-period increases, reaching ultimately even higher figures than in the fore-bath period. 5. The tepid saline baths undoubtedly exercise a stimulating influence on the peripheral endings of cutaneous sensory nerves, the irritation giving rise in a reflex way to increased action of the sudorific centres (which explains partially the effect mentioned in Sub. 2), and, on the other hand, to a similarly increased action of the vaso-motor centres, which effect leads to an intense congestion of the skin, a corresponding decrease in the blood-supply of viscera, fall of the arterial tension, and retarded circulation of the chylus. The retardation constitutes probably a chief cause of a decreased assimilation of fats. 6. The baths afford a powerful therapeutical agent. 7. In delicate and exhausted persons, especially in those of advanced age, their employment requires great caution.

Strontium.—We referred, in last year's ANNUAL, to the study of J. V. Laborde,[164, July 16] with regard to the action of certain salts of strontium, principally the chloride and the lactate. The author has continued his studies, and, in a recent note, has given the results obtained by him from an experimental study of two other salts of strontium, *the orthophosphate and the bromide*, corroborating those previously obtained. Both substances seem to act favorably on the general nutrition.

The strontium was advantageously given to dogs in the proportion of 30 grains (2 grammes) of the metal to 75 grains (5 grammes) of the orthophosphate per kilo (about $2\frac{1}{2}$ pounds) per body-weight. To a young and healthy dog weighing 12 kilos (about 27 pounds) were given, during one hundred and eleven days, $24\frac{3}{16}$ ounces (752 grammes) of the pure orthophosphate of strontium, with apparently no evil consequences. The animal was then killed by puncturing the medulla, and post-mortem examinations showed no lesions of the organs. The stomach, the liver, the intestines, the kidneys, and lungs were absolutely normal. As in previous observations, there was complete absence of tænia in the intestines of the animal, the cause of this being evident.

Finally, upon chemical analysis, traces only of the metal were found in the liver and the urine; 100 grammes (1500 grains) of bone gave 10 grains (0.65 gramme) of the metal strontium. As the phosphate of strontium is a nutritive and assimilable mineral substance, it is thought that it will render great service, especially in dietetics.

The bromide of strontium seems to be more active than the preceding salt; hypodermatically administered to a guinea-pig, it produces complete anæsthesia at the point of injection, accompanied with infiltration and œdema. In about fifteen minutes, when the general system is affected, there are noticed diminution of the reflexes, tremors of the head, and a tendency to somnolence and stupor. In three or four hours these symptoms disappear, but the local paralysis, œdema, and anæsthesia at the point of injection remain for a longer time; while the reflexes or excito-motor functions are diminished or abolished, the action of the salt upon the cerebrum and upon the peripheral motor and sensory nerves is comparatively slight. To produce these symptoms, large doses were administered. Strontium bromide is certainly not very poisonous. For instance, to a dog weighing 10 kilos (about 22 pounds) 60 grains (4 grammes) of the salt were given by the mouth. The animal vomited once, showed restlessness at first, and then went to sleep. With no other deleterious effects, the dog entirely recovered. It appears, therefore, that the fundamental physiological actions of the last remedy are similar to those of the potassium salt, with the important practical difference that the first-named substance is less poisonous, and may be said to possess the activity of the potassium and the relative and absolute innocuousness of the metal strontium.

Thebaine, Narcotine, and its Derivatives.—We have already noticed, in last year's ANNUAL, the researches of Ralph Stockman and D. B. Dott, in regard to the action of morphine and its derivatives. In a continuation of their studies, the same authors,[2 Jan.24] have examined the physiological action of thebaine-methylthebaium sulphate, hydrocotarnine, and cotarnine. They find that *thebaine*, although included in the morphia group, more closely resembles strychnine in its physiological action. The slight preliminary narcotic stage, which is observed after small doses of thebaine, appears to characterize this drug as somewhat different from strychnine, but this is the only difference in the action of the two alkaloids, since that stage is absent after large doses. *Sulphate of methylthebaium* may be included in the morphine group, since it produces both a narcotic and a tetanic stage; given hypodermatically, it even exercises a depressant effect on the spinal cord and a slow paralysis of the peripheral motor nerves; it also completely paralyzes the motor fibres, in large quantities, this paralysis being followed by a stage of increased reflex activity. If large doses of *methylthebaium sulphate* reach the cord directly, there is no primary depression of the medulla spinalis, but a condition of tetanus is produced. The narcotic stage, like that of thebaine itself, is not well defined, its action, especially on mammalia, being paralysis of the motor nerves. *Narcotine* is studied under the forms of *cotarnine* and *hydrocotarnine*, both substances being obtained by a process of oxidation. *Cotarnine* differs from *hydrocotarnine* by 2H, and can easily be transformed into it by the action of nascent hydrogen. The action of *hydrocotarnine* is the same, in kind, as that of narcotine, and much smaller doses are required to produce both the narcotic and the tetanic stages in animals, and also cause slowing of the respiration and slight contraction of the pupil with regard to *cotarnine*. The authors found that it also has a certain amount of paralyzing action on the motor nerves, but that in sufficiently large doses it also causes a narcotic and tetanic stage. The drug, therefore, is included in the morphine group. From the evidence, so far brought forward, Stockman and Dott conclude that the chemical change represented in these three substances does not alter the similarity of their action, but simply affects their dosage; that no radical change of action is produced in them, by the change in chemical constitution; that in all three the kernel of the molecule is probably the same, and, until it is altered, the changes in physiological action are only superficial; bringing to collation that, as they have previously shown, the same is true of morphine, and that it is now known that the same law holds good for some other alkaloids, such as cocaine and caffeine. The authors, in connection with this interesting study, take occasion to refer to the action of *meconoisin*, which they found to simply stimulate the spinal cord in frogs.

Tissue-Extracts, Sterilization of, by Carbon Dioxide.—Brown-Séquard and d'Arsonval[3 Ap.23] have carried experiments with extracts of different tissues after they had been made to pass through a filter previously impregnated by carbonic acid. The authors employed the extracts taken from the liver, spleen, kidneys, etc., and found that when such extracts were previously acted upon by carbon dioxide, in the manner described, they remained inert as to a physiological action. Enormous amounts of those substances were injected hypodermatically, and in not a single instance were deleterious effects produced. The extracts of the pancreas and the muscles were also used, and the only effect produced by the latter liquid was a notable increase in muscular force. The authors, in a previous investigation, had observed that the unadulterated tissue-extracts possess poisonous properties.

Tobacco.—The influence of tobacco on gastric digestion and on the acidity of the urine has been the subject of an especial experimental investigation by J. Ydan-Pouchkine.[67, Feb. 16] The experiments were made on 7 healthy individuals not habituated to the use of the weed. The author studied the effects of the drug on the gastric juice and the motility of the stomach, the degree of absorption and the acidity of the urine, respectively, during three days for each of the respective observations. The main conclusions arrived at are as follow: (1) Tobacco increases the quantity of gastric juice, but diminishes its acidity; (2) the quantity of free hydrochloric acid of the gastric juice is diminished under the influence of tobacco; (3) proportionately to the decrease of the amount of hydrochloric acid there is an equal diminution of the digestive power of the gastric juice; (4) tobacco likewise slows the action of the gastric ferments; (5) these modifications of the gastric juice produced by tobacco last for a period of several days; (6) as regards the motility of the stomach and its power of absorption, tobacco is stated to produce an increase of these functions; (7) tobacco has no influence on the acidity of the urine.

Tonkin Arrow-Poison.—The Tonkin arrow-poison, which is extracted from the *Antiaris toxicaria*, has been recently examined by E. Boinet and T. Hedon[128, Oct.] as to its physiological properties, and found to have no marked effect on the neuro-muscular system or central nervous system. Its effects were totally different from those of curare and strychnine, but it produced, at first, an increase in the respiratory movements, followed by a diminution and final arrest. The heart stopped in systole, due to an action upon the intra-cardiac ganglia.

Trimethylamine.—Combemale and Brunelle[73, Mar. 21] have reported to the Société de Biologie the results of their experiments with this drug. They find that when it is administered by inhalation, subcutaneously, or by the stomach, it produces an excessive flow of saliva, together with an increase of its normal alkalinity. The drug also produces an increase in the nasal and lachrymal secretions and a slight albuminuria. A watery solution of the drug, injected hypodermatically, causes sloughs and ulcers which heal up with great difficulty. Trimethylamine, in doses of ¼ grain (0.016 gramme) per pound (1¼ pounds) of body-weight, reduces the temperature, but, at the same time, produces an increase in the pulse-rate. The minimum fatal dose was found to be about 2½ grains (0.16 gramme) per pound of body-weight.

Veratrum Album.—The chemical constituents of this plant had not been fully determined before the thorough research recently accomplished by Salzberger.[90 Apr.] This investigator, who used in his work 300 kilos (753 pounds) of the rhizome, has found not only the *jervine* (C_{26}, H_{37}, NO_3) of Simon, and the *rubijervine* (C_{26}, H_{43}, NO_3) and the *pseudo-jervine* (C_{29}, H_{43}, NO_7) of Wright and Luff, but has also determined two other crystalline alkaloids, which he has named, respectively, *protoveratrine* and *protoveratridine.* The author, from a number of experiments upon the lower animals, found that jervine had but slight toxic properties, while *rubijervine* and *pseudo-jervine* were absolutely inert. Of the two new substances, *protoveratrine* was extremely poisonous, 0.5 of a milligramme ($\frac{1}{128}$), injected hypodermatically, being sufficient to kill a full-grown rabbit. Introduced into the nostrils, it produced violent sneezing. The formula of this alkaloid is, according to the author, C_{32}, H_{51}, NO_{11}; that of *protoveratridine*, C_{28}, H_{45}, NO_8. Protoveratridine is regarded by Salzberger as a decomposition product of protoveratrine. The formula of the alkaloids of Wright and Luff were verified by the same observer.

Yoloxochitl.—The common name of *yoloxochitl*, according to John M. Maisch,[237 Jan.] is given in Mexico to two species of the magnolia family, the *Talauma Mexicana* and the *T. macrocarpa.* In the seeds of the macrocarpa are found a fixed oil, tannin, coloring matter, and an active principle,—probably a glucoside,—which is said to dissolve the corpuscles of the blood. An aqueous extract of the seeds injected into frogs, in doses of 0.001 gramme ($\frac{1}{64}$ grain), hypodermatically, produces a suspension of both the respiratory and cardiac movements, death coming on very rapidly, through asphyxia. After death the lungs appear in a state of contraction.

ELECTRO-THERAPEUTICS.

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CATAPHORESIS.

McGuire[81, Aug.] reports the use of iodine by cataphoresis in an old case of goitre where subjective symptoms were very severe,—10 to 15 drops on cotton in cup-shaped electrode daily for three weeks —intermission of three weeks—treatment persisted in for three weeks more.

While using it, the patient told him that she tasted the iodine, and afterward that this metallic taste in her throat lasted for hours. The gland was reduced to about one-fifth of the size it was when the treatment was begun, and, in spite of all further use of the remedy, remained stationary; but all of the subjective symptoms were gone, and the lady left in excellent health. Two other cases of chronic goitre have been treated in the same way, and with the same results,—the hypertrophy diminishing rapidly at first, then more slowly, then reaching a point where it became stationary. In 4 cases of recent hypertrophy of the thyroid gland in young women, the enlargement rapidly disappeared under the use of this measure.

McGuire also applied iodine to fibroid tumors where it could be brought directly in contact with them,—the current being 10 milliampères only,—with gratifying results.

Petersen[760, Mar. 21] has employed helleborin, strychnine, aconitia, chloroform, and cocaine (10 to 20 per cent.), the latter without any constitutional results. Its greatest field of usefulness is in maladies of the skin and mucous membranes, or of immediately subjacent tissues; but, of course, it may be given a much greater scope in conjunction with mineral, antiseptic, and alterative baths, which is a problem for the investigations of others in the future.

In persistent supra-orbital neuralgia cocaine thus used gives relief for from four to ten hours, but does not cure neuralgias of peripheral origin. It was used for diagnostic purposes in a case of idiopathic neuralgia of central origin, and, as expected, afforded no relief.

Chloroform causes a dermatitis, and should be used only when counter-irritation is desired in conjunction with a transitory anæsthesia. He has employed chloroform cataphoresis in 1 case of cervical neuralgia with good effect. Helleborin and aconitia have also been used successfully, but the latter, while it gives rise to a deep analgesia, also causes painful smarting and burning, unless combined with a cocaine solution.

In its application, it is sometimes useful to prepare the skin a little before treatment, by rubbing with ether, to dissolve the oil-globules. The anode being applied with the drug, the cathode may be placed anywhere upon the surface of the body, and a current of any endurable strength turned on. The stronger the current, the speedier the effect.

There can be no doubt that the effects of the galvanic current upon nutrition are in part due to the catophoretic transfer of molecules of protoplasm and liquid from one cell to another, or from a cell to a capillary vessel in the path of the anodal stream, and, since the diffusion takes place more readily and more quickly in direct proportion to the current strength, it behooves us to employ as many milliampères as feasible in our galvanization of the atrophied and paralyzed extremities of poliomyelitis, chronic neuritis, and peripheral-nerve trauma. Moreover, there would seem to be a possible advantage in the use of nutritive emollients, in conjunction with the labile application of the anode to the atrophied member, just as they have been combined, from time immemorial, in the exercise of the aliptic art (massage).

Petersen [59, Jan. 21] says that, in order to secure exact dosage, it is only essential to possess a flat metal electrode,—preferably, but not necessarily, of platinum (platinum is now almost as costly as gold) or tin. A nickel-plated surface will answer. This may be made of any size, round or square, convex or concave. A piece of tissue- or filtering- paper or linen is cut to fit over the metal surface. Upon it is placed, drop by drop, the solution of any drug to be used, and the electrode is then applied to the skin. There is then a thin, capillary layer of the medicament in the paper disk between the electrode and the skin, and the quantity of the drug is known. Three or four drops of a 1-per-cent. solution of helleborin on the anode have brought about much more gratifying results than cocaine, a deeper and more lasting anæsthesia, and no constitutional effects have ever been noted. For rheumatic and gouty swellings, solutions of the chloride, benzoate, or citrate of lithium, all very soluble salts, should be employed with the anode. Among mercurial remedies, the imidosuccinate and bichloride of mercury are well adapted for cataphoretic purposes.

Morton,$^{1}_{\text{Apr.26}}$ by a method which he designates "anæmic cataphoresis," causes the drug to act on that part alone for which it is intended. This he accomplishes by cutting off the blood-stream in the part to be treated, by means of an Esmarch bandage or by a rubber ring, especially for the fingers, after the fashion of an umbrella-ring, and then treating by cataphoresis. By means of the anæmic method of cataphoresis, the medicine employed, or some electrolytic modification of it, comes in direct contact with the affected tissue, and remains for a considerable time (as long as the bandage remains in position) in relation with it. He advocates the use of plasters, in place of the moistened disk of papers, as being better conductors. Fraser & Co., 208 Fifth Avenue, New York, have prepared a variety of medicated plasters in measured dosage, and of neutral plasters, which may be medicated as desired.

CATALYSIS.

Moritz Meyer$^{22}_{\text{Aug.19}}$ states that, in order to bring about the greatest possible catalytic effect, in addition to intensity of the current and duration, it is necessary that the part involved should be affected by the greatest possible number of strong circuits. The duration of the sitting should not be longer than ten minutes. He used it with success in obstinate sciatica,—cathode over swollen nerve, anode over the thigh. In cramps from overwork, writers' and piano-players' cramps, cathode over painful spot, anode in infra-clavicular fossa. He also employed it in peripheral spasm of facial muscles. Infiltration in muscles, the subcutaneous connective-tissue glands, sheaths of tendons, small indurations in the "Schnellenden" finger, gouty deposits, exostoses, and stiff joints offered a not less favorable field for treatment. He thought it would be very useful in cases of stiff limbs after injury, periostitis, or cicatrices.

GALVANO-HYSTRESIS.

Under this title S. P. Thomson, $\frac{1}{\text{Aug. 15}}$ of Finsbury, describes some new electric phenomena as follows: "If a sufficiently strong electric current is passed through a coil of insulated, soft-iron wire for a short time, and the wire disconnected, and if, after the lapse of any length of time, the wire is placed in the circuit of a galvanometer, and is then subjected to longitudinal magnetization or to a succession of alternately directed magnetizations, it is found to discharge an electric current through the galvanometer." The direction of the current discharged is the same as that of the original current, and opposite to that in which the current would flow if the wire acted as a condenser. A wire not having been subjected to an electric current will give forth no such discharge; one having been so charged will not give forth more than one discharge of electricity until it has been subjected to the electric current again. The time integral of the discharge current is independent of the duration of the charging current and practically independent of the longitudinally magnetizing current. Its strength is within certain limits proportional to that of the charging current. The author acknowledges the similarity—not identity—of these phenomena to those obtained by Villari by mechanical agitation of iron bars through which electric currents had been previously passed, and also to those observed by Hughes with the induction balance.

GALVANISM.

Neuroses.—Rockwell $\frac{138}{\text{Mar.}}$ has successfully used galvanism in the earlier stages of writers' cramp, and reports the prompt cure of a case of torticollis under the following treatment: At each sitting the muscles of the left side (those that were large and prominent) were submitted to mild galvanization, while the contracted sterno-cleido-mastoid muscle of the right side, toward which the head was inclined, was faradized with a sufficient force to cause relaxation of muscular fibre, allowing the head to turn gradually to its normal position. There was no return of trouble for over ten years, when the same treatment perfected a cure. In cases of angina pectoris, where the pain was of a positive neuralgic character, galvanism and faradism have occasionally brought about results of a palliative and even curative nature. No one doubts its favorable influence over some forms of psychoses; yet, as a remedy, occupying any well-defined position in the treatment of mental diseases, it has yet received no special recognition, nor has it been subjected to any adequate test. And yet, in diseases of the brain, where the mind is seriously affected, there may be just as strong indications for the use of electricity as in diseases of the spinal cord that modify sensation and motion, or in diseases of other organs that interfere with their functional activity.

The galvanic current, however, far more frequently affords relief in cases of mental derangement than the faradic, and, did space permit, many proofs could be given of its efficiency. Not alone, however, should it be applied, as Arndt has suggested, to the spinal cord (and medulla oblongata), with its important vasomotor, circulatory, and respiratory centres, but directly to the head itself. More than usual care should be exercised over the dosage in the treatment of any form of mental derangement, for in these cases we meet with the extremes of tolerance and susceptibility. It is seldom necessary to be careful to apply a current strength of less than 5 milliampères, nor should we often exceed 20. Exceptions, however, are encountered, and cases are met with of profound melancholia where a current to the head of more than 2 or 3 milliampères was not only unpleasantly felt at the time, but left disagreeable sensations for hours subsequently. In nervous dyspepsia central galvanization often very materially modifies the symptoms. Cathode on epigastrium, anode after-treating, the head-rest on the back of neck. Dose, 10 to 30, and even 40 to 50 milliampères. When combined with general neurasthenia, general faradization had best be used.

The great field of usefulness for electricity is that of the functional forms of nervous disease, and because we do not understand their pathology and are still unable to appreciate the errors of nutrition that undoubtedly underlie all these cases, it is no reason why we should not persist in the use of a remedy that has been of such splendid service in their relief.

Gessler[133, Sept.7], warmly indorses the use of galvanism early in peripheral neuralgias,—anode to be applied over painful spot, cathode indifferently, 5 milliampères, five to ten minutes. In persistent cases he combines faradization by means of a brush with the foregoing. In deep-seated neuralgias, sciatica, neuralgia of trigeminus and the nervus accessorius, relapses are apt to occur, and one's prognosis must be guarded. He reports the cure of 4 old chronic cases which had resisted all other forms of treatment; has also used galvanism with success in diseases of the peripheral nervous system, neuritis, and traumatic or rheumatoid paralyses. The results are much less satisfactory when applied to diseases of the central nervous system. Tabes dorsalis, according to the writer, is, above all spinal diseases, relatively the most favorable for electric treatment.

Meyer,[69 July 20] uses the constant current in neuritic and perineuritic exudates, and reports a complete cure in a case of facial convulsive movements which were caused by a swelling in the facial nerve at its exit from the stylo-mastoid foramen. He also secured an excellent result in a stiff, immovable knee, caused by rheumatism, after 89 *séances.*

Gonorrhœa.—Gautier[132 Aug.] has shown that both poles in the galvanic current have a germicidal action, and proposes making use of this in treatment of gonorrhœa in the female.

" Prochownick, in order to use the positive pole of his galvanic battery, used a copper sound of convenient size, which he introduced into the cervical canal. This was connected with the positive pole, and an intensity of 80 to 100 milliampères was used for ten minutes. Three to six sittings were given. The gonococci disappeared and the purulent discharge became serous. In applications of this kind, chlorine is given off, and copper sounds become covered with the chloride of copper, which is a highly antiseptic salt. This, and the chlorine as well, probably exerted some beneficial action. The result here obtained was due to the chemical action which the positive pole set up in the substances with which it was brought in contact." Gautier makes use of another procedure: he covers a platinum sound with a light layer of absorbent cotton, which he plunges into a solution of the iodide of potash. In the urethra he uses the positive pole and an intensity of 25 milliampères. In the cervical canal he uses the negative pole and an intensity of 50 milliampères. His results are excellent.

According to Apostoli,[1004 No. 11, '90; 90 Jan.] the constant galvanic current finds its principal indication in endometritis and fibroma; especially valuable in circulatory and painful affections (amenorrhœa, dysmenorrhœa, and metrorrhagia), it has a powerful action in arresting the growth of benign neoplasms, and in assisting the resorption of peri-uterine exudations. The harmlessness of the intra-uterine treatment is shown by published statistics, especially by his own; from 1882 to 1890 he has made 11,499 applications: 8177 galvano-caustic intra-uterine positive, 2486 galvano-caustic intra-uterine negative, 614 galvano-punctures vaginal negative, 222 galvano-punctures vaginal positive. He has treated 912 patients, comprising 531 cases of fibroma, 133 simple endometritis, 248 endometritis concomitant with peri-uterine inflammation. He has had 3 deaths, the result of the treatment,—2 from galvano-puncture for subperitoneal fibroma and ovaro-salpingitis, 1 galvano-caustic for an ovarian cyst, mistaken for a fibroid. He has seen 30 cases of pregnancy supervening after the galvanic intra-uterine application.

Uterine Disorders.—Danvers$^{61}_{\text{June 27}}$ reports cure of patients with dysmenorrhœa and subinvolution,—large flat abdominal electrode positive pole, vaginal electrode negative pole. Small doses, somewhat lengthy *séances*, frequently repeated. Hitchcock$^{44}_{\text{Mar.}}$ cured a case of subinvolution and chronic endometritis; also noted marked improvement in a case of acute poliomyelitis in a child of nearly 3 years.

Neuroses of Childhood.—Stampa$^{762}_{\text{Nov.,'90}}$ used hydro-electric baths in infantile paralysis, nocturnal enuresis and rachitis, and especially laid stress upon the improved nutrition of the children which underwent this treatment.

Graves's Disease.—Cardew,$^{6}_{\text{July 4,11}}$ like many others, having had indifferent results from therapeutical agents used in this disease, had resource to electro-therapeutic treatment, and quotes from an oration of A. E. Sansom the following pregnant statement: "Though in the less severe cases medicinal treatment has proved to be of great value, it has seemed to me that in the more severe ones drugs have been almost useless." Such an opinion, pronounced by so careful and competent a judge, must carry great weight, and meet with the approval of those who have had an extensive experience in this disease. Sansom was not, however, content with merely a bald criticism; he followed up his statement by alluding to the good results obtained with "the systematic use of the continuous galvanic current in the region of the great nerves of the neck," saying, in conclusion, "I believe that a *prima-facie* case has been fully made out for such a method of treatment of rapid heart." Regarding Graves's disease from its therapeutical aspect, Cardew divides it into four classes: 1. Cases that undergo spontaneous recovery, including such cases amongst women as recover during subsequent pregnancy. 2. Cases that obtain relief or cure from an appropriate drug treatment. 3. Cases that obtain relief or cure from an appropriate electrical treatment. 4. Cases which derive no benefit from any treatment. In considering the effects of electric treatment it is necessary to decide: 1. Is galvanism or faradism the best means to use as regards convenience, comfort, and efficacy? 2. What strength of current should be used? 3. What should be the duration and frequency of the applications? 4. On what parts of the body should the electrodes be placed? The answers are, after carefully reviewing the results of the investigation: 1. Galvanism is superior to faradism. 2. Very weak current strength (2 to 3 milliampères) is sufficient. 3. Each application should last six minutes. Frequent applications (three times a day) should be made. 4. The anode should be placed on the nape of the neck, the centre of its lower border corresponding to the seventh cervical spinous process, and be held firmly in that position during the application. The cathode should be moved up and down the side of the neck from the mastoid process along the course of the great nerves.

Cardew advises that the applications be made three times a day, and sometimes oftener, where attacks of palpitation are frequent, in the day or night. These can be made by the patients themselves, who can be readily instructed how to use either the dry- or wet- cell battery; it is an objection to the treatment, but can be met by the physician's personally attending to the working of the battery during his visits. Any one watching this treatment at first might be discouraged by the relapses, small or great, occurring during the progress of the case without a word of warning. The patients are, as a rule, "neurotic," and exceedingly susceptible to very trifling impressions, which readily react, producing relapses varying in severity. Amongst the most common of these trifling causes are menstrual troubles, domestic worries, disturbed rest at night, digestive troubles, fright, and trifling "colds." Any of these and many others will send up the pulse-rate and increase the existing cardio-vascular conditions to a variable extent. It is advisable not to lay much stress on the day-to-day changes in the symptoms, but rather to take a general view at intervals, inquiring from their friends and themselves how they have been getting on during the intervals.

In attempting to ascertain if there is any order in which the symptoms disappear under this treatment the evidence is not very definite. In Cardew's cases the following was the usual order of disappearance: Minor nervous troubles, depression, irritability, restlessness, and insomnia were the first to yield to the treatment. With these disappearing the general health improves, and the tremors, if slight, become less, or even disappear. In women where the menstrual disorder is slight this yields at an early period. When the tremors are very pronounced, and there is absolute amenorrhœa, these symptoms only disappear much later. The cardio-vascular symptoms then yield, and finally the ocular and thyroid conditions. With reference to the last two, when present together they may disappear together, or one before the other; and frequently one or the other, occasionally both, does not completely disappear, a fullness of the eyes or thickening of the thyroid region remaining as permanent traces of this disease.

Cardew states that we have in electricity a therapeutical agent powerful to do good in the great majority of cases of Graves's disease. Such cases as fail to be benefited by it are, unfortunately, extremely unlikely to derive much benefit from any other therapeutical agent. Its advantages are that it has been proved to be successful by himself and others in cases where everything else has failed. It is less expensive than drugs; it can be carried out by patients equally readily; where a patient is unable to be seen regularly, it can be left in his hands with much more safety than continued doses of digitalis and belladonna. Its disadvantages are: 1. The risk of the battery getting out of order; this may be minimized by good workmanship and proper instructions to the patient. 2. The general belief that if electricity cannot cure in a month it can never cure; this should be settled as incorrect from the first. 3. The discomfort and trouble, which are so slight that patients overlook them.

Hæmorrhoids and Ulcer of the Rectum.—Hutchinson,[138, Sept.] in hæmorrhoids and rectal ulcers, has been most fortunate with a low-pressure negative galvanic current. An electrode of carbon, sufficiently large to distend the pouch moderately, is easily introduced, and a long sitting—forty-five minutes—given, with 20 milliampères of current. Sensation is one of gentle warmth and great comfort, and inspection of the parts afterward shows mucous membrane comparatively pale and well contracted. The ulcers rapidly heal; in a case where there were two ulcers of a centimetre diameter each, both disappeared after four sittings. The rectum must, of course, be thoroughly washed out.

In impacted gall-stones, when not so large as to be immovably fast in the duct, sudden deep reversals of a strong galvanic current—say, of 100 volts milliampère—frequently dislodge them and clear the passage. Two electrodes of equal size are used with buttons of carbon, an inch in diameter, thickly covered with absorbent cotton wetted with salt water. One is worked, carefully and slowly, down under the edge of the right lobe of the liver, aiming to reach the gall-bladder as nearly as possible, and the other sunk as deeply into the left hypochondrium as possible without causing pain. When both are in position, one may be held by the patient or an assistant; the current is swung on instantly, making a dozen reversals, at intervals of ten seconds. Each will be followed by a contractile wave in the course of the common duct and duodenum, and results are prompt. In 2 cases no second application was needed, and in 1 the patient passed some 20 stones, of small size, at the next following stool.

A French *confrère*, Fontaine Atgier, has invented a new machine for electro-therapeutics, which he calls the "Voltagramme," and whose current he styles "oscillatory." He claims that, by using a double coil and special commutator, he collects from a faradic vibrator the current of opening only, thus making from a coil a close approach to the continuous current from a cell. "If the current from a cell or cells be expressed by a straight line, that from the voltagramme may be indicated by a sinuous one, having a tendency to become straight." It may be measured by a galvanometer, and has a special influence upon striped muscles.

Gastralgia.—Einhorn[150 Sept.] cured 6 cases of persistent gastralgia, having failed to give any permanent relief by medicines or faradization. Direct galvanization of the stomach was employed,—negative pole in stomach, 15 to 20 milliampères, ten minutes, two to three times a week.

Constipation.—Stockton,[9 Nov.7] in a paper on "The Use of the Gastric Electrode in Diminished Peristalsis," related that he had obtained greater benefit from the application of the continuous current, with occasional interruptions, than from the application of the faradic current. Twenty-one of 40 cases showed greater or less dilatation, as demonstrated by accurate measurement. Of this number, 12 presented dilatation of an extreme degree. Some are still under treatment, but 5 have been discharged as cured; all have been greatly benefited, and a number have improved to such a degree that absorption takes place properly and the stomach is emptied quite uniformly five or six hours after an ordinary meal.

Gastric Catarrh.—Cases of marked gastric catarrh do best with the continuous current,—the anode applied within, the cathode on the back, from 8 to 15 milliampères being generally employed.

Stricture of the Œsophagus.—Wolff[9 Nov.7] found the galvanic current of the greatest value in dilating traumatic strictures of the œsophagus. He reported an illustrative case in which, by the daily employment of metallic bougies in conjunction with galvanic currents of from 5 to 10 milliampères, a cicatricial stricture of small calibre was satisfactorily dilated.

Rheumatism.—Robinson[9 Nov.7] divided, therapeutically, cases of rheumatism into two classes: 1. Those in which only one or two joints are affected, which he always treats by means of galvanism. 2. Those in which the rheumatic poison is more extended in its action, involving joints, muscles, fascia, etc., for which he employs static electricity. The electrodes used should be large—the larger the better—and carefully made. Joint-rheumatism, pure and simple, is almost powerless to withstand the direct application of the galvanic current. When the disease is more diffused, and involves various tissues and organs in different parts of the body, static electricity is indicated. The general charge is rarely used alone, and static electricity is usually given by means of special electrodes in the form of sparks. The applications may be made on alternate days. The usual length of the treatment is ten minutes, for about five of which sparks are drawn, the patient during the remaining five minutes simply sitting quietly upon the platform and taking the general charge.

Cleaves[9, Nov.7] secured a decided and satisfactory improvement, in a case of subacute articular rheumatism, after 13 *séances*, by means of stabile applications of galvanism, 10 milliampères for fifteen minutes,—cathode applied to affected joints. Von Raitz[9, Nov.7] considers that false ankylosis, even with bony union, yields to the constant current, with the assistance of massage and passive motion, provided treatment is carried on earnestly and intelligently.

Cancer.—J. Inglis Parsons,[22, Dec.24,'90] acting on the hypothesis "that cancer consists of new cells which have been formed during the process of repair or inflammation, and in an active state of proliferation have escaped from the control of the nervous system," used the interrupted voltaic current up to 600 milliampères, and found the soft varieties were good conductors, while a hard scirrhus had a very high resistance. The severe cancer pain is usually wholly abolished by the first application if the whole of the growth can be gone over. The number of applications required will depend upon the size of the growth and the amount that can be done at one application.

In 1 case there were no signs of recurrence at the end of two years; in 2 others no signs of active growth in seven months and one year. It appears to be easy, in ordinary cases, to stop the spread of the disease, because the new cells conduct easily. The older portions presented some difficulty at first, on account of their high electrical resistance, but this has now been overcome by increasing the electro-motive force employed. Outlying glands give very little trouble, and can easily be arrested at one application.

Walling[663, Feb.] favors galvanism in large doses applied by platinum needles or carbon electrodes directly to the carcinomatous mass. Hutchinson[9, Oct.31] stated that he had operated on 16 cases, of which 2 are still living. One was a case of epithelioma of the lower lip removed fourteen years ago. There has been no return, and the patient is in good health. The other was in a woman from whom a breast and the two labia majora were removed; after twelve years she is in good health. He is firm in the belief that carcinoma is curable by galvanism.

Myomata.—In studying the action of the constant current on myomata, Klein[393, B.19, H.1; 90, Jan.] experimented upon myomata freshly removed by laparotomy. He passed currents of varying intensity (up to 100 milliampères) for varying periods (five to sixty minutes). He found the current produced the following effects: 1. A *chemical* action (by the development of acids at the positive and alkalies at the negative pole). This seems to be the most important action. 2. An *electrolytic* action (a chemical decomposition takes place, which is very evident from the gas evolved). 3. A *thermal* action (the temperature of the tissues was raised at both poles, and in many cases from 10° to 14° C.—50° to 57.28° F.). 4. An *injury of arteries, veins, and lymph-vessels*, which may be so great that they are quite thrown out of use, the contents and vessel-walls being so changed that they are no longer permeable. 5. A *physiological* action on the muscle-fibres of the myomata and their vessels, which was shown in contraction and later relaxation. It produces, therefore, corrosion, electrolytic decomposition, elevation of temperature, change in vessels (*i.e.*, destruction), together with contraction and relaxation of muscle-fibres. Microscopic examination showed evidence of change in the muscle-fibres and connective tissue at both poles, but no interpolar changes. The cells around the positive pole become shrunken and coagulated; those around the negative pole become swollen.

Massey [9, Mar. 26] reports the cure of a large myoma, different cysts of which were tapped six times during treatment, by the vagino-abdominal galvanic alternatives,—dose, 150 milliampères, repeated weekly. The Apostoli intra-uterine method was used at first, but failed.

Blackwood [760, May 16] states that, in 20 cases in his practice, during the last seven years, 11 have undergone diminution of the mass of not less than 60 per cent., in the opinion of physicians who previously had charge of the women; 4 show no lessening of bulk, but all hæmorrhage and reflex trouble are entirely gone in these instances; the rest have shrunk from 10 to 15 per cent., as nearly as can be made out by measurement of the mass, both internally and externally. He uses currents of 250 to 600 milliampères. Veit [69, Oct. 29] treated 40 cases of myomata, and of these two-thirds were discharged, with more or less improvement in the symptoms.

Fibromata.—Kellogg [9, Oct. 31, '90] gives the results obtained in 60 cases. Of these, 4 were not treated sufficiently long to give the treatment a fair trial. Nine cases, 1 of which was a soft myoma, were made worse, or not much benefited. In 5 cases the tumor was not diminished in size, but other symptoms were considerably relieved. In 11 cases the tumor was not diminished, but the other symptoms, pain, weight, etc., entirely disappeared. In 17 cases the tumor was considerably diminished and the patient restored to good health. In 14 cases the tumor disappeared entirely or became barely perceptible.

Of 32 interstitial cases, the tumor was, in 9 cases, diminished in size and other symptoms were removed. In 6 cases the tumor was not diminished in size, but the other symptoms disappeared. In 9 cases the tumor was not diminished in size, but the other symptoms were in part relieved. In the 14 cases that comprised all of the cases completely cured, both the tumor and the symptoms disappeared.

Of 9 cases of subperitoneal growths, 4 were not benefited, or were made worse; in 1 case there was slight benefit; in 2, other symptoms were relieved, but the tumor was not reduced in size; and in 2 the tumor was reduced in size and other symptoms were wholly relieved.

Of 15 cases in which the tumor was both subperitoneal and interstitial, in 5 the treatment completely failed; 1 was slightly benefited; 4 were relieved of symptoms without reduction of the tumor; and in 5 there was reduction of the tumor and relief of other symptoms.

It thus appears that the cases of fibroids most benefited by electrolysis are those in which the growths are interstitial. Interstitial and subperitoneal growths are not benefited in the same degree. Subperitoneal tumors are the least susceptible of benefit. Submucous fibroids are the most amenable to treatment, but of this class no well-defined cases had come under observation.

Of the 14 cases in which no material results were accomplished, 78.7 per cent. were under 40 and 42.7 per cent. did not exceed 35. In the cases of fibroid tumor in which other symptoms were cured, but in which the tumor was not diminished in size, the average age was 43.7 years. In cases in which the tumor was considerably diminished and the patient restored to good health, the average age was 40 years. In the 14 cases in which the tumor entirely disappeared or became barely perceptible, the average age was 37.9 years.

FARADISM.

Rockwell$^{59}_{Feb.14}$ calls attention to the different physiological and therapeutical properties of the induced currents, especially in bipolar faradization. The current from the primary coil of short, thick wire is called the current of quantity; that from the outer coil of long, thin wire, the current of tension. We may say that the currents have elective properties, or properties special to each, but the reciprocal relations between the nervous system and the action of electricity are not yet sufficiently understood to offer a satisfactory explanation of the interesting fact that in external local faradization the current of tension is the most effective, both as to objective and subjective symptoms, while in internal local faradization the so-called current of quantity acts most vigorously. With bipolar faradization the current from the primary or first induction-coil of the continuous-coil apparatus corresponds very closely with the current from the primary coil of the separate or double-coil apparatus. The wire is short and thick, offering very little resistance to the passage of electricity, and so gives forth a current of little tension but large quantity, so called. When applied externally, its appreciable influence is very slight. Its tension is so low that it overcomes, with exceeding difficulty, the resistance of the skin that must be encountered in all external applications. Its reflex as well as direct influence is, therefore, very slight, and it only moderately excites cutaneous sensibility. When applications are made within the body, a most extraordinary increase in energy is manifested.

Far more severe in its influence, however, is the second current of the series,—that proceeding from the primary and second coils of the combination. Externally applied, it is comparatively weak, although far stronger than the other; but when applied by the bipolar method to the uterus or vagina, its extraordinary action on motor and sensory parts will hardly be credited without actual demonstration of the fact. The advantage of these first two currents of the series over the last two, presently to be described, lies almost wholly in the effects of their internal application, and especially by the bipolar method. Both currents, and especially the current from the combination of the primary and second induction-coils, act as powerful muscular tonics when applied internally, and are capable of exciting contractions of the involuntary muscular fibres of the uterus of every degree of severity. For this reason it is invaluable in cases of post-partum hæmorrhage and in the ordinary form of subinvolution. As regards the action of the primary induction-coil, some cases of hyperæsthesia of the scalp and face, and not a few cases of pain of a true neuralgic type and superficial in character, are more readily relieved by this current than by any proceeding from the pure induction-coils unassociated with the battery influence.

The third current of the series—that proceeding from the primary and the second and third induction-coils—is of unique quality so far as relates to its effects when applied externally. Like the primary coil, it will electroplate, but, unlike it, it will not burn steel or iron. The peculiarity of this combination of the coils is, that the maximum of power to contract the muscular tissue when the application is made through the medium of the skin is here obtained. Each additional coil that is now attached simply gives a decreasing contractile power. This current, possessing less quantity but far greater tension than the two preceding, already considered, exerts by no means the same influence over the contractions and sensibility of the vagina, uterus, rectum, or bladder; but its energy of action in this direction is greatly superior to the fourth current of the series, next to be described. To emphasize the advantages in bipolar faradization of this combination of helices over the separate form, mark the distinct and varied effects obtained from the first named. The current from the primary coil, although very weak when applied externally, exerts very positive effects upon both the sensory and motor nerves when applied internally. From the primary and second induction-coils we obtain a current the effects of which are tenfold greater, and the utmost caution is called for in its application. Adding the third induction-coil, the application still being internal, the sensory and motor effects are yet marked, although far less severe than the current from the preceding coils, but greatly in excess of the fourth and last current of the series. This current, for the production of which all four coils are necessary, is in many respects the most important, and has a range of usefulness wider than the others. Its action is pre-eminently tonic and sedative.

The currents from the two preceding combinations of coils are exceedingly harsh, and so keen and cutting in character as to be absolutely painful if carelessly administered. This current, on the contrary, is always agreeable, or at least not painful, even when administered to the point of endurance.

Therefore, in the operation of general faradization, when we desire to obtain the best constitutional tonic effects that electricity is capable of giving, we resort to this combination of the coils. For the relief, therefore, of that great army of symptoms that are so familiar and perplexing to those who have much to do with neurasthenic cases, there is nothing to be compared with it.

When persistent failure follows endeavors along this line of electrization, the cause of failure must be attributed to hasty and faulty methods of administration. Even more marked is the difference in the action of this current of tension and the current of quantity in bipolar faradization of the rectum, vagina, and uterus. Its comparatively mild action on the motor and sensory nerves, coupled with its great power of overcoming resistance, renders it, *par excellence*, the current for the relief of pain.

His conclusions in brief are as follow: 1. From the continuous-coil apparatus, owing to its combination of helices, the wires of which differ in thickness and length, proceed four qualities of current that vary in a most remarkable degree in all the properties of electricity,—physical, physiological, and therapeutical. 2. That the variation is observed most markedly when applications are made internally to the vagina, uterus, rectum, or bladder by the bipolar method. 3. From the primary or first induction-coil we obtain a current of quantity that is barely perceptible externally, but internally, and especially by the bipolar method, acts with greatly increased efficiency. 4. From the combination of the primary and secondary induction-coils we obtain a current of greater tension, but which still acts mildly when applied externally. Applied internally, however, its effects are far greater than the first coil, both in exciting the sensibility and contractility, and the utmost caution must be exercised in its use. In the same degree, also, it acts upon the vagina, rectum, bladder, and testes. This current is especially applicable in the treatment of enlargements of the uterus due to subinvolution, but is of little or no value when the enlargement is due to fibrous tissue. It is of especial value in post-partum hæmorrhage, and, from its power to excite the sensibility and contractility of the bladder and rectum, it may be used with good effect when these organs are anæsthetic or suffer from diminished or lost contractility. 5. From a combination of the first, second, and third induction-coils we obtain the maximum of power to excite both sensibility and contractility on the external surface of the body, each additional coil simply giving a decreasing power over sensation and contraction. Applied internally, however, it acts far less powerfully than either of the two previously named currents; but in the ordinary forms of paralysis of voluntary muscles it will more readily call forth contractions than the current from any other combination of coils. 6. From the first, second, third, and fourth induction-coils combined a current is obtained, differing from and superior to all the others in its sedative and general tonic effect upon the system at large. It neither acts upon the sensibility nor muscular contractility, when applied externally, as does the third current of the series; nor with a tenth or even a twentieth part of the acuteness, when applied internally, that characterizes the second current of the series. For the purposes of general faradization, however, it is the only proper current to use, and for applications to the vagina and uterus, for the relief of many forms of pain, it possesses properties that are invaluable.

Blackwood[121 Nov.] also draws attention to the differential faradic coils, and distinguishes different qualities of the current, either a high voltage under a low ampèrage, or a high ampèrage with low pressure. This is secured by the windings in the dynamo, or the quality of the current may be altered by a converter. The rapidity of interruption also alters the character of the current, for a rapidly and finely interrupted current will prove smoother and less irritating than one from a rheotome, making and breaking the circuit less frequently; and one from a very long coil of very fine wire will prove much more soothing to pain than one from a helix, or shorter and coarser wire. Simple trial will convince any one of this. Try it, and see. In applying the faradic current to deep-seated muscles, or to the viscera, always use the coils of long and fine wire, *i.e.*, those of high resistance. When treating muscles for paralysis, particularly those of the superficial layers, employ the coarser helices; this gives the effect of a slowly interrupted galvanic current to an appreciable degree, minus its chemical power. In using any coil for its penetrating power, place the one over the point to be reached as closely as possible, and the other at a place diametrically opposite; whereas, in trying to influence superficial muscles or nerves, keep the two on the same plane as far as convenient, and more or less close to each other, thus preventing undue dispersion of force, which will occur in all applications, owing to the tendency of currents to flow in an ovoidal form, —the stronger lines of force going axially, and others in curved lines, reaching their widest distance from each other at the polar centre, so to speak.

Pruritus Senilis.—Julia Carpenter[786, Ap.] reports a case of pruritus senilis, in a man of 74, cured by the use of the faradic current over the affected area in one week's time.

ELECTRIC BATHS.

Stevenson[6, Apr.26] says that the direction of the current is not specially indicated in the treatment of most affections by the electric bath, but in rheumatoid arthritis and lateral sclerosis the positive pole should always be placed at the head of the bath, so that the current enters the spinal cord between the shoulders. It seems to have some specific action upon the cord, and in the case of lateral sclerosis appears to reduce the tendency to increased reflex excitability. Under this treatment the spastic gait is improved and the tendency to tonic spasm in the limbs reduced. Mercurial tremors are also treated by electric baths. As many as twenty-five have been required to produce a cure, but alcoholic tremors can often be cured by six or eight baths.

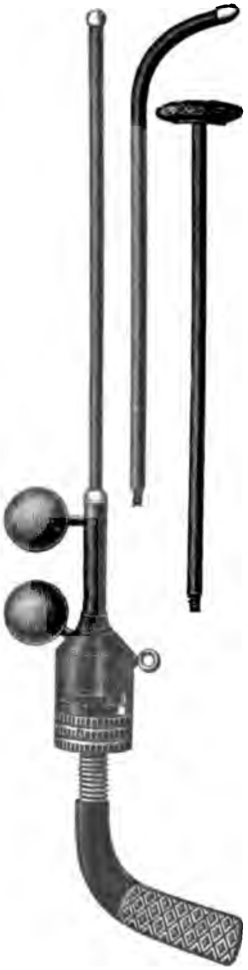
ELECTROLYSIS.

Wende[170, Dec.,'90] caused the almost total disappearance of an epithelioma of the nose, and, in four sittings, the complete disappearance of numerous venereal warts of the glans penis. Wessinger[339, Sept.] reports the cure of 3 cases of fibroma simplex in a few sittings,—current 10 to 15 milliampères.

ELECTRO-PUNCTURE.

Goitre.—Massey[760, Feb.14] reports the cure of cystic goitre of large size,—negative puncture, 35 to 40 milliampères at first; later, free incision, with application of positive gold-bulb electrode to inner wall of tumor, once 100 and again of 50 milliampères. Green[760, Feb.14] used tin electrodes covered with muslin, placing the positive pole on the inferior cervical ganglion and two negative plates upon the tumor, one on each side. The sittings lasted for five minutes each, being repeated three times a week, for from two to three months. Some preparations of the iodides were also used. Favorable results were obtained in about 50 per cent. of the cases.

Lupus.—A. W. Jackson[186 May] reports the cure of 2 typical cases of lupus by galvano-puncture.



MORTON'S INTERRUPTED-CURRENT ELECTRODE.
(*Medical Record.*)

STATIC ELECTRICITY.

Morton[1 Jan 10] described a new system for the therapeutic administration of static electricity. It comprised the development by an influence-machine of a rapidly interrupted and graduated current, by means of a circuit-breaker introduced into a circuit, with and without condensers, and in the medical application of this current, without and within the human body, by moistened sponge or other electrodes, just as in the case of the ordinary galvanic and faradic currents. It involved the removal of the spark, in itself more or less disagreeable and painful, and often difficult to localize, especially about the face and neck, away from the patient's body, and yet retained all the physiological effects of the kinetic or current part of the circuit. This he accomplished by a circuit-breaker, which consisted of a pair of metallic-ball electrodes, introduced at any point of the circuit, having a narrow air-space between the balls; the circuit "made" when a small spark overcame the resistance of the intervening air, and "broke" when it failed to do so, and the current was due to rapidly successive equalizations of the differences of potential of oppositely charged condensers, whether prime conductors or with the addition of

Leyden jars. It was applicable to every form of muscular paralysis, for there was no practical stimulus to nerve and muscle except the electric, and none more energetic than this form of it. Its effects upon the Hallerian irritability of the muscular tissue included an effect upon the lymphatics, and to this might doubtless be referred many clinical results of relief, as in lumbago and all forms of muscular rheumatism, subacute and chronic rheumatic affections of joints, ovarian or pelvic pain, sciatica or other neuralgias. One of the characteristics of this current was its power of relieving pain. Gynæcologically, this system of conveying the current within the cavities of the body opened out a wide and promising field of clinical results. From a very considerable experience, the author was satisfied that this current penetrated more deeply into the human body than did that of the galvanic. In conclusion, the new points brought forward were: 1. The generalizing of what the author had announced as an isolated fact in 1881, that a regulated interruption in the otherwise inoperative circuit of a Holtz machine would produce in another part a current adapted to electro-therapeutic practice. This current was now designated the franklinic interrupted current. It included the adaptation of the parts of a Holtz machine to produce the results. 2. A new electrode combining this current with the various terminals. 3. The practice of introducing franklinic electricity in current form into the interior cavities of the human body.

ELECTRIC MASSAGE.

Mordhorst[116 N.J.; 191 Oct.] makes use of a massage electrode, consisting of an elastic roller, of varying size and shape, according to the part of body to be treated. He claims that massage with this apparatus is more efficient than with the hand: (1) because the pressure is stronger and more uniform; (2) it is less exhausting to the physician; (3) it permits of a more thorough and rapid examination of the muscles, tendons, nerves, and joints, all irregularities (nodules, tubercles) being more readily detected than with the hands; (4) a much stronger constant current can be used by moving the massage electrode than by the stabile method of application; (5) the pressure of the massage electrode produces much deeper electric effects than a simple stabile current applied to the skin; (6) owing to the stimulating effect of massage upon the soft parts, the blood-vessels and lymphatics are markedly dilated, the circulation in the affected parts is increased, and, owing to simultaneous application of massage and electricity, the effect of the latter is greatly enhanced.

THE ELECTRO-MAGNET.

Kummer $^{197}_{No. 10, '90;}$ $^{99}_{Oct. 18}$ located a sewing-needle imbedded in the right knee by means of a magnet. An incision was carried down to the capsule of the joint without finding the needle. On placing a galvanometer-needle in the wound, such an action was manifest that the operator felt no hesitation in opening the joint. A considerable quantity of sanguinolent synovia escaped, and the needle was found in the upper angle of the incision, lying between the synovia and the fibrous capsule.

Kocher had a patient in whom, after anomalous nervous symptoms, lasting many months, a needle was discovered by means of the galvanometer; and Dumont records a case in which a primary operation was unsuccessful in removing the foreign body; but a second operation, aided by the galvanometer, enabled the operator to reach the seat of trouble. In addition, several cases are cited by Graeser, Lauenstein, and Kalin.

In illustrating the advantage of the electro-magnet for the purpose of extracting buried particles of iron or steel from the tissues, Charles C. Barrows $^{59}_{Dec. 19}$ reports the following interesting case: "On September 4th, Mrs. B. brought her little daughter, Margaret, down from her country-place on the Hudson, to consult me about the removal of a piece of cambric-needle from the child's right thumb. On the day previous to her coming to me she had broken off, in the ball of her right thumb, about an eighth of an inch of the length of a fine sewing-needle. The child had attempted to extract it herself with the point of a pair of scissors, but had only succeeded in driving it deeper into the tissues. She was then taken to the local physician, who attempted to remove the fragment, but without success. At his suggestion, poultices were applied to the thumb to draw the needle out. As the needle declined to be drawn out by the poultices, on the following day the mother brought the child to me.

"On examination, I was able to locate the needle by the sensation of pain it produced on pressure over the point of entrance, which had been considerably enlarged by the various efforts at extraction. I could not, however, reach it or seize it with the finest-pointed forceps. The repeated attempts at extraction had made the thumb very tender, and had well-nigh exhausted the child's patience. I then determined to try the effect of a very powerful electro-magnet, feeling sure that no ordinary magnet would have the slightest effect on so minute a particle of steel so deeply sunken in the muscles of the thumb. I took the child into the office of the Edison Electric Company, which happens to be near my office. Mr. Hadley, the manager, very kindly connected up for me a very powerful electric motor, and permitted me to use the electro-magnet which constitutes a part of the machine. By placing the child's thumb against the pole of the magnet and gently kneading the tissues, the fragment of needle was drawn up so that it could be felt with a sharp-pointed instrument in the bottom of the small wound. A piece of soft iron with a sharp point was then placed in contact with the pole of the powerful electro-magnet, and the point was brought into apposition with the end of the piece of needle, bringing the fragment with it as it was withdrawn. This procedure was entirely painless."

Laudmann[69, Mar. 28] was enabled to diagnose the presence of a small piece of iron in a finger by means of the magnet-needle.

THE DYNAMO IN MEDICINE.

Wilkinson[106, July] gives a simple and practical means of reducing the high voltage of an ordinary electric-light current: "The larger your wire is in diameter from the mains, and the shorter in length, the less resistance it offers to the current; there is always loss to the ampèrage, even in the resistance of copper wire. As the current enters the house, it is, for safety, made to run over the lead fuses. If a current is passing along a wire, and this circuit can be tapped, so to speak, by connecting a wire in a manner somewhat similar as is done in multiple-arc wiring, then the current will divide,—part going on the original circuit and part on this shunt wire. In this way the voltage is reduced about one-half each time you shunt. This shunting process can be kept up until you reduce the voltage in a regular series, and, by means of a switch, you can use such a current as you like. Take, for instance, 9 volts and 250 milliampères on short circuit, pass this through the current-controller or rheostat, and then through the milliampère-meter, and you will have a splendid current for both galvanism and electrolysis (the electro-chemical cautery). The current I make use of is regulated in voltage 9, 17, 28, 36, 47, 56, 66, and in ampèrage from a few milliampères to 1 ampère. You can regulate to a nicety the milliampères by the position of your electrodes,—the farther apart, the more ohms in resistance. Inasmuch as the electro-cautery and the electro-magnet for eye purposes require more ampèrage than the fuses will allow to pass,—and if you increase the size of your fuses and take such a great amount of ampèrage off the dynamo,—the chances are that all the lights from it will be greatly depreciated for the time being, and your call for all this strength will be inquired into by the light company.

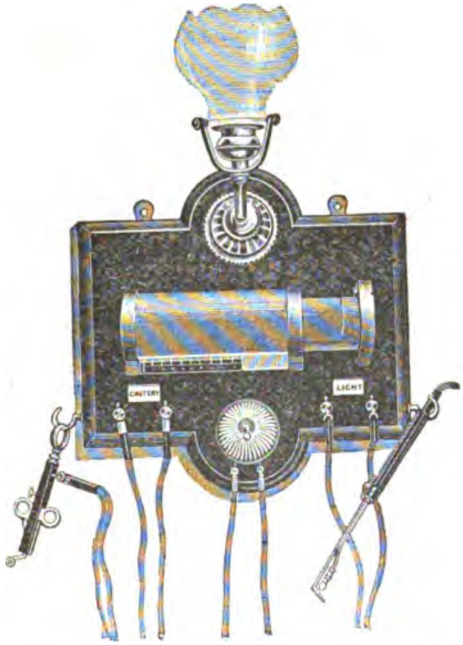
"There is still a greater objection. You cannot well use this current, for, with all this voltage and ampèrage, should you short-circuit any part of the patient's body from the cautery, the shock would be terrific. If you had shunted the voltage for this purpose—to do away with the possible shock—you have also reduced the ampèrage, and your fuses would have to be just so much the larger, and you would ask for just so much more current from the dynamo. There is no reason why this cannot be done; but you would reduce the lights in the circuit every time you turned the switch of your cautery with this great amount of ampèrage and small amount of voltage."

To remedy this, he makes use of the storage-cells (Julien), which need only be charged once or twice a month; by them the ampèrage can be easily controlled to any quantity.

MISCELLANEOUS ELECTRICAL INSTRUMENTS.

Einhorn's "Deglutable Stomach Electrode" $\frac{59}{May}$, consists of a hard-rubber capsule (about 1¼ inches in length) perforated with numerous openings, this cage serving to protect the metal knob within from direct contact. The connecting wire runs through a fine flexible-rubber tube. The capsule is readily swallowed and tolerated by the patient, and contact is secured, as in Bardet's electrode, by water in the stomach. The faradic current has been generally employed, and in all cases the degree of acidity of the stomach has been markedly increased. The author makes a preliminary report, which goes to show that most decided results have been obtained in cases of dilatation and in grave cases of chronic gastric catarrh. Two cases of pure gastralgia showed an amelioration after use of the constant current. The majority of cases of hyperacidity were improved, but required the administration of alkalies in the usual way.

Woakes, $\frac{6}{\text{Aug. 8}}$ describes "An Electrical Transformer for Surgical and Medical Purposes." In the engraving three pairs of terminals are seen. One pair is arranged for supplying current to the electric cautery; the second pair illuminates a surgical incandescent lamp; while the third pair supplies "faradic" shocks,—so that, in one machine, the surgeon has at his command electricity for any of these three purposes. An incandescent lamp of eight-candle power is placed at the upper part of the instrument, and indicates by its light when current is passing into the transformer. The conversion of the electricity takes place by induction between coils of insulated wire placed in close proximity to one another. Two of these coils are plainly visible,—an inner and an outer; the inner or primary coil, projecting about one-third of its length, contains an iron core, and slides with it in and out of the outer or secondary coil. This latter is composed of several distinct circuits of various thicknesses and lengths of wire, according to the intensity and quantity of current required. The primary coil is of high resistance, and through it the current supplied to the installation, usually at 100 volts, passes. The strength of the currents induced in the secondary coils varies according to the depth at which the primary coil is inserted into them, being strongest when it is completely inclosed and weakest when fully withdrawn. An index, with pointer, is attached, to indicate the relative positions of the coils, as previously ascertained, for any particular purpose.



WOAKES'S ELECTRICAL TRANSFORMER.
(*Lancet.*)

This arrangement for regulating the strength of the current is economical as well as convenient, since the current absorbed by the primary coil is more or less proportional to that taken up by the secondaries. For the purposes of the cautery a maximum current of 20 ampères at an electro-motive force of 6 volts and a minimum current of 2 ampères at ½ volt can be supplied, according to its size and the degree of heat required. In the same way the current for giving shocks varies between a slight sensation and one that can be hardly tolerated; while the current for a surgical lamp, laryngeal or other, can be varied in like manner to suit any of the ordinary lamps in use. With regard to the current for giving "faradic" shocks, it may be as well to mention that it varies slightly in character from that supplied by the ordinary medical coil; the interruptions are more rapid, the electro-motive force is about the same, while the current is greater in quantity. It will be of interest to note whether this periodic increase combined with a larger current will in any way alter the therapeutic value of the shocks. To meet the case of the continuous-current supply—a system adopted by some companies—an interrupter is introduced into the circuit of the primary coil: it occupies the place of the indicating lamp, which then becomes unnecessary. The interrupter is of specially strong make, and is designed to vibrate very rapidly in order to insure a sufficient number of impulses to produce steady currents in the secondary coils.

CLIMATOLOGY, BALNEOLOGY, AND HYDROTHERAPY.

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CLIMATOLOGY.

General Questions in Medical Climatology.—Ebermayer[370, Aug.15] combats the popular view that the beneficial influence of forest-air is chiefly attributable to the large quantity of oxygen and the small amount of carbon dioxide contained therein, together with its balsamic and aromatic vapors. It is a well-known fact that, under the influence of sunlight, plants absorb carbonic-acid gas and exhale oxygen, but the author calls attention to the fact that plants, like animals, also absorb oxygen and exhale carbon dioxide, both during the day and night. For this reason the air in forests contains more oxygen and less carbonic acid than the atmosphere without during the day, while during the night the contrary is true. There are a number of other factors which serve to diminish the quantity of oxygen in forest-air. A certain amount is utilized during the process of vegetable decay, and the exchange of gases taking place between the air outside the forest and that within, diffusion being greatly accelerated by the winds, also tends to equalize the proportion of oxygen in forest-air and the atmosphere of treeless plains. The undoubted hygienic influence of forest-air must, therefore, be ascribed to other agencies. One of these is the greater purity of such air and its freedom from noxious gases, dust, and micro-organisms. Owing to the shade afforded by the trees in summer, the air and soil of the forest is kept cool during the day; the diurnal variations of temperature are also slighter, especially in summer, and the amount of moisture in the air is relatively smaller than in the atmosphere of the vicinity. It has been found that the air immediately above the tree-tops and at the edge of the forest contains a larger proportion of ozone than the air in the interior, where a portion is utilized by decaying vegetable matter. Although ozone is no longer considered of as high hygienic importance as formerly, it certainly contributes to the purification of the air, by destroying the noxious gases resulting from the decomposition of vegetable and animal matter. The protection against strong winds afforded by forests to the neighboring places is another of their valuable features. The peculiarities of the soil of forests also contribute to their hygienic value. The author's investigations, as well as those of others, show that it is much less adapted to the growth of micro-organisms than that of cultivated fields or of towns. This is chiefly due to the moderate degree of moisture of the forest-soil and its poverty in the substances which are necessary for the development of disease germs. A study of epidemics of cholera and yellow fever demonstrates the fact that these disease germs always avoid towns and villages surrounded by forests, and that, after clearing of forest-lands, they frequently appear in localities which previously had never been visited.

An article on "Cold and Mortality"$^{38}_{\text{v.8,1st Q}}$ contains much food for serious reflection. The author, Benjamin Ward Richardson, endeavors to throw some light on the question why, during the periods of extreme atmospheric cold, there is so great an increase in the death-rate. From a study of the mortality statistics, he deduces the law that variations of temperature exert no marked influence on the mortality of the population under the age of 30 years; but, after the age of 30 is reached, a fall of temperature sufficient to cause an increased number of deaths acts in a regular manner, in waves or lines of intensity, according to the ages of the people. If these lines are made nine years long, it is found that they double in effect at each successive point. Thus, if the fall of temperature be sufficient to increase the mortality at the rate of 1 person of the age of 30, the increase will run as follows: 1 death at 30 years of age will become 2 deaths at 39 years of age, 4 at 48 years, 8 at 57 years, 16 at 66 years, 32 at 75 years, and 64 at 84 years. The fall of temperature produces its results by reducing the force of the living organism and disposing it to die. These factors are at work wherever the low wave of temperature affects the animal body,—abstraction of heat from the body beyond what is natural, arrest of chemical action and of combustion, paralysis of the minute vessels exposed to the cold. These combined effects exert an influence on healthy life in the middle-aged, and there is no disease which they do not influence disastrously.

Climate and Disease.—At a meeting of the American Medical Association, May 4, 1891, N. S. Davis[61 Aug. 15] presented a paper on the "Relations of Meteorological Conditions to the Origin and Prevalence of Acute Diseases." His conclusions, which were the result of careful investigation, are summarized as follows: "Whenever we have coincidently an abundance of decomposing animal matter on the earth's surface, a favorable temperature, slow atmospheric currents, a minimum of moisture, and a little active vegetable growth, albuminous ammonia will appear most abundantly in the atmosphere; sufficiently so to cause the rapid growth of pathogenic organisms, or the evolution of toxalbumens or ptomaines, thus partially explaining the rapidity of development and spread of some important epidemics. On the other hand, when we have coincidently either dry, cold air or rapid vegetable growth, with rapid atmospheric currents and frequent fresh, falling water, we have increased indications of the presence of the active oxidizers—ozone and hydrogen peroxide—with the minimum of albuminoid ammonia in the atmosphere. The influence of these combinations of atmospheric elements on the prevalence of both endemic and epidemic diseases is pretty clearly shown by the recorded observations made in Chicago during the last ten years, particularly in typhoid fever, pneumonia, and epidemic influenza, or *la grippe.*

G. Wilkinson[106 Oct.] offers the suggestion "that the weather service should make of the climates a science, to give us warnings by forecastings of the wet- and dry- bulb hygrometer, so that, along with the dew-point and the frost-point in case of the critical temperature for cold-blooded life (the crops), we may have, also, warning, by fixing for us a critical temperature, as to the best clothing to wear and the hour of changing, if we propose to be acclimated to all weathers in any climate in which we would live."

Roewer[41 Dec. 18, '90] opposes the view expressed by Stokvis at the International Medical Congress at Berlin, that the power of resistance of the healthy adult European living in the tropics quite equals, and in some measure is superior to, the vital power of the native races (see ANNUAL, 1891, D-6). He states that an observation of Europeans living in the tropics at intervals of a number of months or years will show a rapid decay of the physical powers,—a degeneration all the more surprising when it is considered that most of these persons emigrate at an age when their vital energy is most marked. Europeans who have lived for some time in the tropics are much less able to withstand the heat than new-comers, and it seems as if a prolonged residence renders the nervous system hypersensitive to thermal influences, and creates a disinclination to physical exercise, which is of itself harmful. The diminished vital power is also evinced by the increased demand for sleep and rest which manifests itself after a time; the sleep, which at first is refreshing, becomes restless, and finally a nervous form of insomnia supervenes. The Anglo-Indian military statistics furnish a direct proof of the diminished resisting-power of Europeans living in the tropics. They show that among those who have served more than ten years the mortality is greater than among those who have served for a shorter time. The fact that the highest death-rate occurs among soldiers during their first year of service is attributed by the author to the excesses in alcohol and venery indulged in by the new-comers, who at first pursue the same manner of living to which they have been accustomed in Europe. To preserve his vital power as long as possible the emigrant should lead a regular life, adopt a proper diet, live in a healthy and airy house, take sufficient rest, and avoid all extravagances; a European should not think of engaging in physical work. Of course, the conditions of life are not the same in long-established colonies, where everything can be obtained that will contribute to the preservation of the vital powers, as in a newly-founded colony, where the settler is exposed to all sorts of hardships; and this explains the high mortality in the latter. In any case, however, the European is always compelled, in the course of time, to leave the tropics and rejuvenate his shattered physical and mental powers in a colder climate. For persons serving as soldiers, the author recommends a furlough of one year in Europe after three years of service in the tropics; residence in high altitudes in the tropics has thus far proved an efficient substitute. As regards the diseases prevailing in the tropics, it is shown by statistics that Europeans are not any more predisposed to infection than the natives, although the latter recuperate more rapidly, and their health is less seriously affected by the chronic diseases, such as dysentery. The author also takes a discouraging view of the future of children of European stock born in the tropics, which, he thinks, suffer from the climatic conditions to an equal extent with their parents. For this reason, it has been customary to send them to the home-country at an early age. The conclusion drawn from all this is, that acclimatization of Europeans within the tropics can never be accomplished without a loss of the special characteristics of the race.

H. B. Baker[79, Ap.] concludes that, in Colorado, the saturation of the air with vapor of water apparently increases, and the reverse of this process decreases, the unfavorable effects of a cold temperature toward the causation of deaths from consumption. In Colorado, as elsewhere, the danger from consumption is much greater in winter than in summer. This, in the author's opinion, will be found to be a universal law.

Some practical notes[806, Ap.] on the Indian climate are based upon information received from a military man who had lived much in India. According to this informant, seven thousand feet is about the height for a permanent residence of Europeans, five thousand feet being the lowest altitude at which malaria can be avoided. The ravines of the mountain-slopes, through which the roads of ascent lie, are many of them more unhealthy than the plains below. No places are more deadly, as regards malaria, than some sites of this kind half-way up the mountains. Sleeplessness is a constant phenomenon in new arrivals at the hills, and for this reason it is customary to become acclimatized by staying for a week or two at a somewhat lower station; but this must not be done at anything less than five thousand feet.

Climatotherapy.—P. C. Remondino[44, Je.] terms Southern California the Paradise of old age, and states that on the Pacific coast of California longevity is common, examples of extreme length of existence being found at many points, from San Francisco down as far as Cape San Lucas. The cause of this, in his opinion, is the constant uniformity of the climate, which renders it exempt especially from pulmonary or abdominal diseases. T. D. Myers[2052] presents a much less attractive picture of the climatic conditions of California. A residence of five years in the various parts of the State has convinced him that there are serious objections to California as a summer or winter resort for consumptives. In summer the objectionable features are the dryness of the air, the dust, the cold, the fogs, and winds, while in winter they comprise the high degree of humidity due to the frequent rains, the shifting cold winds, and the difference between the sunshine and the shade. The author finds that the hot, dry winds which prevail in summer (the Norther or Santa Ana) have a decidedly depressing influence on the nervous system, while the dust, which frequently has alkaline qualities, produces inflammation of the mucous membrane of the nose and throat. Owing to the considerable number of tuberculous persons in California who have made permanent homes there, and who, in pursuit of their avocations, travel about from place to place during the dry season, the danger of infection through inhalation of desiccated and pulverized tuberculous sputa is, in Myers's opinion, very great. For these reasons he regards himself as warranted in saying that " there is not a desirable climate for tuberculous invalids anywhere within the domain of California in the summer." In search for a winter climate in California, filling as nearly as may be all the requirements for an out-door life for a tuberculous subject still reasonably active, he thinks we will find ourselves limited to the territory south and eastward of the Santa Inez and Sierra Madre mountain-ranges, and extending from Point Conception to San Diego, from the mountains named to the sea. These views are completely confirmed by A. C. W. Beecher,[760, Oct. 24] who protests vigorously against the policy of sending a patient with advanced pulmonary disease far away from home unless accompanied by his family. Although Southern California has been termed the land of perpetual sunshine, the patient should be provided with warm clothing, and provision should be made for the heating of apartments, so as to combat an emergent cold-snap or the chill evenings, which are frequent. W. A. Edwards,[483, Aug.] after three years' residence in Southern California, is very favorably impressed with the climate of San Diego. This country presents within its boundaries various altitudes,—from 360 feet below the sea to 11,000 feet above the sea-level. The average yearly rain-fall is 11 inches; there are few days in the summer months on which one cannot be out-of-doors for at least a portion of the twenty-four hours. In Southern California pneumonia, bronchitis, pleurisy, asthma, renal affections, and erysipelas are of extremely rare occurrence.

K. D. Shugart,[44, June] praises the climate of Riverside, in the upper part of the Santa Ana Valley. The air is dry, and, as the place is about fifty miles distant from the ocean, the trade-winds lose much of their moisture before reaching there. For the same reason fogs are of rare occurrence. W. M. Yandell,[79, Dec.,'90] from a study of the official records of the Signal-Service Department and of the Surgeon-General's office, regards himself as warranted in saying that Texas, west of the 104th parallel of longitude, and New Mexico and Arizona, south of the 35th parallel of latitude, furnish by far the best winter climate in the United States for consumptives. J. H. Worth[79, May] presents the views of the medical fraternity of New Mexico on the climate of this section of country. New Mexico may be irregularly divided into three districts: an elevated, treeless plain to the east, a mountain plateau to the west, and a river-valley lying between. Its chief characteristic is the dryness of the air. The unfavorable conditions existing are those common to all dry, high altitudes, *i.e.*, rapid changes of temperature from day to night and occasional southeast winds. The author's inquiries among physicians show a remarkable absence of phthisis among the native population. In his opinion the cases not benefited by the climate are: (1) cases in which the amount of lung-tissue left is insufficient for respiration at lower levels; (2) emphysema; (3) bronchial dilatation; (4) phthisis occurring in the aged or in those too weak to take exercise.

A. C. Standart[79, Dec.,'90] cites statistics to prove that the extreme yearly range of temperature in the Great Salt Lake Basin is less than that of any other inter-mountain region of note, either in the United States or Continental Europe. The monthly fluctuation of the thermometer does not exceed 50° F. (10° C.), and the humidity is under 50° F. (10° C.). This region enjoys immunity from high winds and severe electric storms. There are localized within its borders all the advantages accruing from mountain resorts, supplemented by salt-water bathing, tonic properties of sea-air, and ready access to thermal springs.

G. S. Liggett[1, Mar.28] has spent a winter in Arizona in the foot-hills of the Catalina Mountains, and thinks that for an out-door winter climate this region is unsurpassed, while higher in the mountains there are magnificent places for summer resorts.

W. P. Munn[161, Jan.] presents some practical conclusions regarding the class of cases benefited by the Colorado climate. Incipient phthisis, especially the hæmorrhagic type, is almost invariably improved, a large majority of such cases being restored to perfect health. If the process of solidification has not involved more than one lobe of each lung the prognosis is also favorable, although not as good as in the former class. Extensive cavities are occasionally obliterated, but more frequently the progress of the disease is simply arrested or retarded. In many others in whom the disease process is very far advanced, the prognosis is almost as bad as it would be at sea-level, and such patients should return to their home-surroundings as soon as possible. The author advises patients against coming to Colorado during March and April, which are always the worst months of the year.

J. H. Kellogg,[79 Jan.] in an elaborate and instructive paper, discusses the "Requisites for a Closed Sanitarium in Colorado." His remarks are thoroughly practical, and cannot but meet with general approval. F. Peterson[1 June 14] regards the climate of Cuba as adapted for patients suffering from tuberculosis, rheumatism, and neurasthenia, but speaks unfavorably of Florida as a resort for consumptives. He thinks that for consumption Aiken and Thomasville present the best advantages of any resort east of the Rocky Mountains, being warm enough for a winter residence, dry, and the number of sunny days being above the average of many other places. Asheville is considered a better summer than winter resort, and the advice is given that the months of January, February, and March should be spent farther south, owing to the unpleasant weather. The author's last statement has provoked a criticism by H. L. Taylor,[1 Aug 1] who states that the atmosphere of Asheville is as dry as desirable in the ordinary winter, and the patients wintering here are not enervated by the heat and moisture of more southern places.

W. F. Hutchinson[760 Dec.20,'90; Jan.3,'91; Apr.25; May 30; June 6] continues his charming descriptions of the West Indies as a sanitarium. These papers are not only entertaining, but convey much practical information regarding the climatic, sanitary, and social conditions of the islands which the author visited. J. B. Mattison[157 Jan.] gives some personal impressions of Bermuda as a health resort. He does not think that it is the place for consumptives nor for any one far advanced in any wasting disease, but it is the happy land for the neuralgic and those convalescing from acute diseases. The most pleasant months in this island are November, April, and May. C. O.

Ryerson[39, Apr.16] calls attention to the great diversity of the climate in Jamaica, varying from 80° to 86° F. (26.7° to 30° C.) at the sea-coast to 45° to 50° F. (7.3° to 10° C.) on the tops of the mountains. He concludes that the warmth, dryness, lightness of atmosphere, the small range of temperature, and invigorating sea- and mountain- air render the island an excellent health resort for consumptives.

M. Charteris[79, May] advises that before recommending a sea-voyage certain idiosyncrasies be considered, the chief being sea-sickness. For this we have no specific, although careful dieting before and after sailing do much to prevent its occurrence. It must be remembered, however, that errors of diet will not alone account for sea-sickness,—some stand the sea well, some badly. For this reason, it is a prudent step to advise any one for whom we consider a sea-voyage desirable, to take a short experimental trip in a coasting steamer, and from it to judge of his or her fitness to undertake a long voyage. If this test should be unsatisfactory, if there be great prostration and timidity, a long sea-voyage would accentuate evil, and do more harm than good. As to the time of the year most suitable for starting, the proper time for leaving Great Britain is at the beginning of October, and the return voyage should be so arranged that the arrival home should be about the middle of April. The author recommends a trip to Melbourne or Sydney, the patient not remaining at either of these ports, but proceeding to Tasmania, the Riverina of New South Wales, or the Darling Downs of Queensland. On returning, in the middle of February, there is little chance of unfavorable winds or prolonged fogs if the route selected is by the Cape of Good Hope or by the Red Sea, by way of the Suez Canal and the Mediterranean, or to San Francisco, thence to New York, and home.

W. E. Fisher, a surgeon in the Pacific Mail Steam-ship Company, regards the proneness to seasickness as greatly exaggerated. His experience has shown him that persons afflicted with chronic diseases, such as phthisis, dyspepsia, gastric catarrh, etc., are seldom, if ever, subject to seasickness, and that, after the first two days, it is rare to find any one seasick. P. S. Donnellan[760, Aug.3] states that a sea-voyage is especially indicated in patients suffering from incipient phthisis in which there is no evidence of active tubercular disease (pyrexia, night-sweats, hæmoptysis, or diarrhœa). After a few weeks in the tropics the cough disappears, the appetite improves, and there is a marked increase in weight. Patients who are imperfectly convalescent from pneumonia, pleurisy, typhoid fever, and surgical operations are much benefited, while the anæmia of puberty in young girls soon disappears under the tonic and oxygenating effects of the sea-air. Amenorrhœa is often cured by a sea-voyage. Patients having a gouty or rheumatic diathesis, or suffering from hepatic or gastric disorders, are, however, seldom benefited by this treatment, and may even become worse.

E. Friedrich[6, Feb. 7] combats the view that winds, especially easterly winds, cause the removal of the salts from the sea-water, and, more or less, their dispersion. On the ground of his own experience and an exhaustive study of the literature of the subject, he concludes that the saltness of the sea-air results from infinitesimal particles of the water dispersed by the waves and tide, currents of air causing further distribution of the finest saline particles. He attributes the therapeutic value of sea-air to the greater humidity, purity, and density of the air, as well as to its more uniform composition, and not to the presence of the saline constituents. The greater quantity of ozone also exerts a favorable influence; but of paramount importance, especially in serious cases, is the selection of a suitable climate and a favorable situation. The only islands in the North Sea which are considered appropriate health resorts in winter are Norderney and Frehr.

L. Secretan[197, Jan.] presents his observations of the winter climate at Leysin, in the Alps, which he regards as preferable to that of Davos for consumptives and persons in feeble health. He finds that the climate is milder and drier, that there is a greater proportion of sunny days, and that the temperature is less variable. The article is illustrated with numerous elaborate meteorological charts and tables, evincing a careful study of the subject. We learn[214, Sept. 15] that a large sanitarium is in process of construction at Leysin, at an altitude of 1450 metres, which is to be equipped with all modern conveniences.

E. P. Thurstan[22, Aug. 19] claims that, in six points, the climate of the Canaries (Puerto-Orotava) excels that of all other winter resorts, viz.: (1) it has a higher winter temperature (64° to 66° F.—17.8° to 18.9° C.); (2) it has probably the most equable temperature in the world; (3) it has the most uniform barometric pressure, probably, in the world; (4) there is absolutely no risk of a dangerously low temperature, even for an hour,—minimum shade temperature, 48° F. (8.9° C.); (5) there is marked absence of strong winds; (6) the amount of ozone is extraordinary. The sanitary conditions, however, are poor, and the drinking-water, when derived from tanks, is apt to produce a sort of low fever. The diseases which seem to do especially well at Orotava are incipient phthisis and the hæmorrhagic form of the disease, chronic winter cough, and cases of granular kidney.

A. S. Wise $^{79}_{\text{May}}$ is very favorably impressed with the climate of Ajaccio, the principal town in Corsica. He describes the climate as soft, temperate, more pleasant than any part along the Riviera, and, although liable to variations of temperature, these are not so pronounced as at Nice and Cannes, or even Mentone and San Remo. There is a marked absence of wind and dust. The mean temperature during winter is about 55° F. (12.8° C.). The average number of rainy days is thirty for the season, and the relative humidity is 82° F. (27.8° C.). The cases most likely to be benefited by a winter's residence are lung affections, with high temperatures and nervous irritability, especially the crethrystic form of phthisis, for which Alpine heights are so unsuitable. Gout, cardiac affections, chronic bronchitis, asthma, Bright's disease, and scrofulous affections in children are also improved. The drawback to a residence in the island is the lack of good hotels. E. Vidal $^{211}_{\text{Nov.1}}$ advocates the establishment of free sea-side sanatoria for the treatment of scrofulous children. The patients should be in the early stages of the disease, and the management of the sanitarium should be directed by physicians. At Giens, where a hospital of this kind is in operation, the children remain, on an average, four months under treatment. I. Owen $^{2}_{\text{Jan.10}}$ states that the chief characteristic of the climate of Sicily is its equableness. From October to May it is seldom either oppressively hot or disagreeably cold. November and December constitute the wet season, and are regarded as the worst part of the winter. Palermo, on the north coast, and Taormina, on the east coast, are the places at present most suitable for a long stay. The former town has a mild and somewhat relaxing climate, while that of the latter is more bracing. Von Kremser $^{6}_{\text{Aug.2}}$ has recently published the results of his observations of the climate of Heligoland, made since 1875. In his opinion, the island is the best representative of the sea-climate in the German Empire. The variations of temperature are less than in any other part of Germany. The highest mean temperature does not set in before the middle of August. September is warmer than June. The lowest mean temperature is common to January and February. Autumn is warm, winter mild, spring cold, and summer cool. From November to January Heligoland is, on an average, the warmest place in Germany; in summer the coolest, except in the mountains.

T. M. Madden$^{22}_{\text{Oct. 29}}$ describes the climatic conditions of Montpellier, the chief town of the department of Herault, in France. The atmospheric constitution of this place, which was formerly much in vogue as a winter resort, is characterized by dryness and warmth, accompanied by a tendency to great and sudden alterations of temperature, and the occasional prevalence of strong winds. The diseases most likely to be benefited are, in the author's opinion, chiefly cases of chronic rheumatism, humoral asthma, and chronic laryngeal and bronchial affections, attended with profuse expectoration, but not with much irritation.

E. J. Slade$^{131}_{\text{Dec., '90}}$ presents the climatic advantages of Ilfracombe, a town situated in the west of England, on the shore of the Severn Sea. The summers are comparatively cool, thunder and lightning being of rare occurrence; the air is bracing without being keen, and fresh without pungency. Owing to the proximity of the Gulf Stream, the winters are mild, and this, together with the equableness of the temperature and dryness of the soil, renders the climate a suitable one for consumptives and persons suffering from gout and affections of the stomach, liver, and kidneys.

Baruch$^{191}_{\text{Feb.}}$ insists that it will be a glorious day for medicine when the cardinal principle of phthisi-therapy will be recognized to be, as he believes it is, an abundant supply of pure air, to facilitate the entrance of which into the lungs every effort should be made, together with a perfectly hygienic environment. Formerly, it was thought absolutely essential to send a phthisical patient to the South. A semi-arctic region, like the Adirondacks, would have been regarded by our forefathers as absolutely detrimental, if not fatal. To-day many consumptives find relief and cure in the cold, dry air of mountainous New York and in distant Colorado, as well as in the mild atmosphere of the South of

France, or of Algiers or Florida. When contending climates have exhausted their arguments (which are as interesting and profitable to us, in connection with phthisi-therapy, as were formerly the arguments on the various vaunted antiseptics in surgery), the cardinal principle of treatment will stand in bold relief, and it will be clearly apparent that it is not this or that particular climate,—it is not this or that particular altitude,—which is most conducive to recovery, but the condition which affords to the patient the best opportunity for an out-door life, in air that is free from dust and other deleterious matters. These are the true curative factors.

BALNEOLOGY.

Mineral Waters.—E. Henry Kisch,[1, May 23] the consulting physician at Marienbad (Bohemia), warmly recommends the use of these waters in the treatment of obesity, especially the plethoric form. Kreutzbrunnen and Ferdinandsbrunnen, at Marienbad, belong to the cold, alkaline, saline waters, the former containing a larger quantity of sodium chloride and sulphate of sodium than the famous Sprudel, at Carlsbad. In cases of obesity, associated with fatty liver, the internal action of the waters is supplemented by the use of mud-baths and mud-cataplasms.

George M. Foster[79, Jan.] describes the thermal springs of Salt Lake City, which are situated along the western base of the Wasatch Mountains. Two of these—viz., the Warm Springs (103° F.—39.5° C.) and Beck's Hot Springs (130° F.—54.4° C.)—have been utilized by the erection of baths of the most primitive kind. The waters from the various hot springs form a lake about one hundred acres in extent, whose overflow is into the Jordan River. They contain considerable quantities of hydrosulphuric-acid and carbonic-acid gases; the solid ingredients are present in small amounts. Taken internally, the water is mildly laxative, but it is chiefly employed in baths, for the treatment of rheumatic affections of the joints, lead poisoning, cutaneous eruptions, scrofula, etc.

L. Bruck[267, Jan.] gives an interesting account of the mineral springs of Australia, the majority of which are situated in the province of Victoria. The best in Victoria is the Hepburn, situated eighty-one miles northwest of Melbourne,—an earthy, acidulous water, resembling that of Cheltenham and Swalbach. The only sea-side resort with developed mineral springs in Victoria are the celebrated Clifton Springs, near the shore of Port Phillip Bay, the waters of which are chiefly charged with carbonic-acid gas, and possess chalybeate, alkaline, aperient, and tonic properties. In New South Wales the only developed mineral spring is the Rock Flat, two hundred and sixty-seven miles south of Sydney, which is strongly carbonated and alkaline. The most interesting springs in Queensland are the Innot Springs, which have a temperature of 189° F. (87.3° C.), and are strongly impregnated with sulphurous-acid gas; they have gained considerable reputation in the treatment of chronic rheumatism, gout, liver and kidney diseases.

A. Ginders,[2, July 4] gives an interesting account of the thermal springs in the north of New Zealand. They vary in temperature from 60° to 212° F. (15.6° to 100° C.), differ widely in composition, and comprise five principal classes, viz., alkaline, saline, alkaline-silicious, sulphuretted, and acid waters. The spring that has gained greatest repute—the "Priest's Bath"—is said to contain 22 grains (1.43 grammes) of pure sulphuric acid and 3 grains (0.19 gramme) of pure hydrochloric acid to the gallon, its temperature varying from 91° to 106° F. (32.8° to 41.1° C.). A well-equipped sanitarium has been established by the government of New Zealand on the southern shore of Lake Rotorna, in the centre of the district of hot springs. The Johannis Spring, situated at Zollhans, in the province of Nassau, has been analyzed by a member of the *Lancet* Special Analytical Commission. It appears to be a remarkably pure, strongly carbonated table-water, possessing slightly alkaline properties.

A charming account is given[663, May] of the Hot Springs of Arkansas. The amount of hot water which is discharged from these springs every day is about five hundred thousand gallons, the temperature ranging from 93° to 200° F. (33.9° to 93.3° C.). Although formerly patronized, for the most part, by victims of syphilis, they are now resorted to by large numbers of persons suffering from other diseases, such as gout and rheumatism. Persons who have become disused, as a result of a life of luxury and inactivity, and fagged-out brain-workers and neurasthenics, are greatly benefited by a course of these waters. The climatic conditions are excellent, the temperature never approaching the freezing-point even in mid-winter. H. Paschkis[6, Mar. 14] has published an analysis of the Guber water of Snebrenica, in Bosnia. Four tablespoonfuls contain ⅓ grain (0.022 gramme) of iron and about $\frac{1}{150}$ grain (0.00043 gramme) of arsenic. When the effect of the water is to be a local one on the stomach or intestines, it is recommended that it be taken fasting; while, if the effect aimed at is a general one, it should be taken with food. According to the author's experience, nervous dyspepsia or any kind of dyspepsia in neurasthenics is most benefited by the Guber water. Semmola[57, Aug.30] calls attention to the curative virtues of the Hunyadi Janos water, when administered in small doses (20 to 30 grammes —5¼ to 8 drachms), in cases of faulty tissue metamorphosis, especially in chronic congestions of the liver. To obtain these results, it must be given in sufficiently minute doses to prevent laxative effects, so as to favor the absorption of its saline constituents. H. Moissan[10, Dec.9,'90] has analyzed the contents of a number of siphons of Vichy water, and found that they all contained lead. He ascribes the contamination to faulty soldering of the tops of the siphons.

T. M. Madden[22, Aug.30] highly praises the springs of Spa, a town situated in the Ardennes. He states that the Spa is the most accessible and one of the most enjoyable of continental chalybeate watering-places, though the mineral waters are not the most powerful of this class. The chief spring is the Ponhon, which is situated in the centre of the town. The season commences on the first of May and ends on the last day of October, but after the end of September the weather becomes stormy. The waters are employed with success in anæmia, certain forms of dyspepsia, and diseases of the kidneys.

K. Guth[34, May 19] has investigated the properties of the newly-discovered Kaiserquelle, at Tolz, upon tissue metamorphosis. The waters of this spring are saline and contain traces of iodine. Their chief tendency seems to be to increase the quantity of urine and stimulate tissue metamorphosis.

In an article on "General Natural Sand-Baths, and Their Action on the Temperature, Pulse, Respiration, Bodily Weight, and Tactile Sensibility," N. V. Pariisky[586, No.37,'90; 90, June] gives the results of experiments on 25 soldiers suffering from various rheumatic affections (articular rheumatism, sciatica, periostitis, etc.) or scrofulous cervical adenitis. The observations were made during the summer months, being carried out in the following manner: After the sand had become heated by the sun's rays to a temperature of from 46° to 50° C. (114.8° to 122° F.), it was piled up in heaps, again exposed to the sun for an hour, and then thoroughly stirred up, so as to secure a uniform temperature of about 47.5° C. (117.5° F.). The patient was stripped, laid down, and quickly covered from his feet to his chin with an equal layer of sand from ten to fifteen centimetres in thickness, the head being protected from the sun's rays by a wet cloth. After remaining from thirty to forty minutes in the bath, the patient's body, which has speedily become covered with a layer of wet sand, is rubbed with dry sand, and then washed with tepid water. The effects were found to be similar to those of other varieties of baths, although less pronounced. They were well borne, even by patients suffering from cardiac or vascular disease. There was a slight rise of temperature, the pulse and respirations were usually accelerated, the blood-pressure always rose to 20 to 30 millimetres, and, on an average, 606 grammes (1¼ pounds) of bodily weight were lost after each bath by sweating. The author concludes that these baths will probably prove especially useful in rheumatic or scrofulous cases complicated by vascular sclerosis, cardiac lesions, etc.

D. J. Niazery[153, July], states that mineral waters containing nitrogen —such as the Panticosa Springs and those charged artificially with the gas—have a sedative action on the nervous system and retard tissue metamorphosis. He recommends their use in incipient tuberculosis.

Idelson[26, Oct. 1] reports some investigations made by A. J. Voskresensky, of St. Petersburg, with the view of determining the effects of tepid aromatic baths, which are highly esteemed in Russia in the treatment of rheumatism, scrofula, and syphilis, and many chronic affections of the skin. The baths were prepared as follows: A muslin bag containing various aromatic herbs (chamomile, rosemary, lavender, mint, etc.) was put into the tub, thoroughly soaked with hot water, wrung out, and this same procedure repeated, until a full-sized bath was obtained, the resulting aromatic infusion having the color of moderately strong tea. The temperature of the bath was 95° F. (35° C.), and its duration thirty minutes. In a series of experiments, linseed-oil was poured over the surface of the water, to prevent the volatile constituents of the herbs from penetrating the bathers' respiratory organs. The general conclusions arrived at by Voskresensky are opposed to Leichtenstern's teaching that aromatic baths made in the ordinary way (that is, without a protecting fatty layer) cannot possibly be placed in the same category with non-aromatic ones, since they act on the system not only through the skin, by stimulating the latter, but also through the circulation. The volatile substances (essential oils, terpenes, camphor, aromatic acid, etc.) inhaled by the bather and carried by the blood-current to various organs and tissues of his body cannot fail to develop certain physiological effects peculiar to the drugs of that category.

Adam[411, No.8] recommends baths containing fir-bark in the treatment of neurasthenia and diseases of the heart and lungs. Owing to their astringent and anticatarrhal effects on the mucous membranes, they are also useful in diseases of the female organs and to suppress profuse perspiration of the skin.

Ewald[2058, v.11, p.57, '89] gives the following practical indications for the use of mineral waters in the treatment of chronic gastric catarrh: In cases where we desire to stimulate the gastric functions we should employ the different thermal waters containing sodium chloride. To counteract hyperacidity or hypersecretion we should make use of alkaline waters; the latter, as well as the pure bitter waters, are indicated where the gastric disease is associated with disturbances of the intestinal functions. Waters containing Glauber's salts are decidedly contra-indicated in all conditions originating from a depressed nervous system. In the latter case we should resort to the acidulous or the pure alkaline waters, especially those containing iron, and the weaker chalybeate waters should be employed, together with the use of peat-baths or thermal baths, massage, electricity, change of climate.

T. Schott[6, May 23] reminds us that balneological treatment is an agent of great power as regards its influence on the heart; and that, unless it be applied with due caution and under uninterrupted medical supervision, results the reverse of favorable may ensue. The treatment of cardiac incapacity should commence with baths containing chloride of sodium in the proportion of 1.5 per cent., with the addition of chloride of calcium to the extent of 1 to 1.5 per 1000, and, in the early stages of the treatment, the duration of a bath should never exceed ten minutes. As regards temperature, one varying from 91° to 93° F. (32.8° to 33.9° C.) is suitable to conditions of anæmia and rheumatism, but for cardiac cases the proper temperature is 95° F. (35° C.). The mineral strength of the baths should be increased, in proportion as they agree with the patient, up to from 2 to 3 per cent. of chloride of sodium and from 0.5 to 1 per cent. of chloride of calcium, and, lastly, by the addition of carbonic acid. The duration of the bath must be increased simultaneously with its concentration, without, however, ever exceeding twenty minutes, especially in serious cases. As the course proceeds the temperature of the water is to be reduced by cautious steps, with attentive observation of the heart, pulse, respiratory organs, and of the general health. Further, intervals of repose should interrupt every course. At first the bath should be omitted every second or third day, until the system has accommodated itself to the treatment and is ready to bear stronger and more frequent baths. H. Keller,$^{214}_{\text{Apr.16}}$ on the ground of careful experiments made on himself, concludes that (1) a 3-per-cent. sodium-chloride bath, of a temperature of 35° C. (95° F.), and of thirteen minutes' duration, has a distinct diuretic effect, while sweet-water baths produce a considerable diminution of the urinary secretion; (2) saline baths of a strength of 3 to 6 per cent. produce marked increase of chlorides in the urine, sweet-water baths having an opposite effect; (3) saline baths of a strength of 3 to 6 per cent. occasion a marked diminution of phosphoric acid in the urine, the effect of sweet-water baths being much less decided; (4) the nitrogenous waste is not influenced to any extent, although the excretion of uric acid is diminished by 6-per-cent. saline baths; (5) the healthy intact integument does not absorb the constituents of the bath, but is capable of marked imbibition. A. Robin$^{10}_{\text{May 11}}$ has investigated the effects of sodium-chloride baths upon nutrition. He finds that these baths increase nitrogenous metabolism and the oxidation of the products of the retrograde metamorphosis of albuminoids. Baths of a strength of 6 per cent. increase the metamorphosis of tissues rich in phosphorus, but slightly diminish the quantity of uric acid excreted, while baths of a strength of 12 per cent. have an opposite effect. Baths containing 24 per cent. of salt diminish the quantity of uric acid and nitrogenous excretory matter. On the ground of these theoretic considerations, it would seem that these baths are chiefly indicated in diseases in which there is either a reduced nitrogenous metabolism or a decreased oxidation of nitrogenous substances or increased metamorphosis of tissues rich in phosphorus. They may, therefore, be employed with advantage in scrofula, rickets, chronic inflammation of the uterus, rheumatism, gout, etc. In cases of anæmia in which the nitrogenous changes are diminished, these baths are suitable in conjunction with ferruginous preparations, but they are contra-indicated when these processes are augmented. In diabetes they are only available in the latter stages, when there is diminished oxidation of nitrogenous substances. In obesity the same considerations hold good.

Becker,[69 June] has observed excellent results from sea-baths in chronic inflammation of the middle ear in scrofulous subjects, although in chronic dry catarrh their use proved of no value. In general, diseases of the ear are not, in his opinion, benefited by a sojourn at the sea-shore. Riedlin[370 Sept.] writes enthusiastically of the beneficial effects of baths charged with carbonic-acid gas by means of a new patented procedure. The baths can be prepared for household use, and will, he claims, act more efficiently than the carbonated natural mineral waters. He believes that carbonic acid is the most potent curative agent in mineral-water baths. Its presence in the water enables the body to be subjected to much lower temperature and for longer periods on account of its stimulating effect on the skin. The gas is also absorbed by the skin when the pressure under which it exists in the bath exceeds that of the carbonic acid in the blood-vessels and lymphatics. The author regards carbonated baths as a tonic *par excellence* in chronic diseases of the heart, and as an alterative in gout, diabetes, obesity, chronic rheumatism, etc. The new apparatus obviates the necessity of heating the water to set free the contained gas, and enables it to be charged with much larger quantities. L. R. Dibble,[72 July] vaunts the virtues of a mineral spring at Versailles, in Morgan County, Missouri, in catarrhal troubles of the stomach, and as a local application to chronic ulcers of the leg. The chief ingredients of the waters are sulphate of potash and alum and sesquioxide of iron. P. Bernard,[55 June 10] calls attention to the newly discovered mineral springs of Genestelle, in the province of Vivarais, in France. The waters are alkaline, ferruginous, strongly charged with carbonic-acid gas, and are recommended in affections of the stomach, liver, and kidneys, and in anæmia, chlorosis, and diabetes. They also form an excellent table-water. E. Tillot[152, Apr. 24] gives the results of his experience during thirty years with the thermal waters of Luxeuil. They form two groups,—the saline and ferruginous,—the former being especially indicated in rheumatism, gout, chronic metritis, and neuralgias, and the latter in anæmic conditions. J. Gason[22, Aug. 15] speaks of the baths of Lucca, a place in the Apennines, as the healthiest, coolest, and cheapest summer resort in Italy. There are five separate bathing establishments of natural hot water, varying from a temperature of 93° to 130° F. (33.9° to 54.4° C.). These baths are much valued in Italy for their effects in rheumatism and diseases of the intestines, liver, spleen, and kidneys.

HYDROTHERAPY.

The past year has been fruitful in this important branch of therapeutics. The establishment of two new journals,[1001; 870] together with the improvement noticeable in another,[465] testify to the increased interest manifested in the subject. Moreover, the establishment of public baths in New York City and the great interest manifested by philanthropic bodies in their possibilities have given an impulse to the sanitary application of water in this country which will probably result to the welfare of city communities.[79, Dec.,'90] In New Orleans, the Sanitary Aid Association is erecting a large public bath, consisting of steel tanks, the outflow from which is intended to flush the gutters, and thus serve a double sanitary purpose.

The most important testimony to the medical value of water has been gathered from clinical teachers in Europe.[191, Sept. to Nov.] Ziemssen, Erb, Semmola, Cantani, Fraenkel, Hoffmann, of Leipzig, and Dujardin-Beaumetz are cited as warm advocates of hydrotherapy.[465, Dec.]

That practical men in this country are awakening to the fact that water is a remedy of undoubted value is evident from numerous contributions in the journals.[59, Feb. 6] An important contributor to the literature of the subject is Hiram Corson, of Plymouth Meeting, Pa. Unfortunately, his advanced age has withdrawn him from the arena in which he has long been a valiant defender of ice and cold water in the exanthemata, diphtheria, etc. When a practitioner of sixty-five years' experience, and of such high standing in his State and country, says, "It is amazing to me that so few physicians use cold water as a remedy in inflammatory affections. Of all means of cure in such affections there is not an equal to it," we must pause and examine the subject.[112 Nov.]

Bell[465 Oct.] describes the "People's Bath" erected by the New York Association for Improving the Condition of the Poor, and quotes from an editorial written by Baruch.[760 Aug., '89] which "is believed to be the first publication in this country urging attention to the 'rain-bath.'" In the "People's Bath," tubs are dispensed with and replaced by the spray douche; the latter having the advantages of rapidly cleansing the body, reducing the consumption of water and attendance to a minimum, and economizing the space. Cleanliness of the bathing-room can be rapidly obtained and all danger of contagion, which would deter many from the tub-bath, entirely avoided. The bathing-room of the "People's Bath" is divided in nine compartments, each of these being about eight feet long by five feet wide. Each room contains hooks for the clothes of the bather, and a rubber cloth to throw over them to keep them dry. At the end farthest from the floor are hot and cold faucets, and a large, perforated brass ring, through which the water descends in a rain-like shower upon the bather. Fourteen of these rooms have no tubs. The floors are of slate, and there are stationary stools in each. The iron work of which the partitions are made is painted white, and the walls of the main room are of white glazed tiling. It is to this part of the building that the charge of five cents is made. There are seven rooms in the basement, just as clean, but not quite as commodious as the others; these are free. To each applicant is given a long crash towel, thick and soft and about two feet wide. With this goes a cake of soap, unscented, two inches long, an inch and a half wide, and a quarter of an inch thick. The soap is incased in a paper bag, and the applicant is told to take it home. A similar arrangement for bathing large numbers was introduced into the New York Juvenile Asylum by the attending physician, and is being introduced in other institutions in New York and other cities.

A. Rose[150 July] relates his personal experience during twelve years with cold river-baths in winter. He found that, the colder the water, the more beneficial was its effect. During the first two years he was troubled with rheumatoid pains, localized in the right ankle-joint, after the baths, especially on rainy days; but these disappeared permanently during the third winter, and a tendency to recurrent attacks of severe coryza was also removed. The baths were taken between 6 and 7 o'clock in the morning, and even when the thermometer was as low as 10° F. (— 12.2° C.). On a windy day, if the weather was not too cold, he was able to dispense with the towel, and dry himself by walking up and down in the breeze. Contrary to what is usually thought, the cold river-bath exerted a very agreeable effect upon the writer, even when he was tired and exhausted, and when compelled to be up all night it served to refresh him as much as sleep. The sensation of rigor, ordinarily experienced by those unaccustomed to the cold bath, was never observed by him. Late in fall, when the weather was cool, a marked hyperæmia, and even a cyanotic discoloration of the entire body, appeared during the bath. In winter, however, when it was still colder, the skin became anæmic in the bath; but this anæmia yielded to hyperæmia after emergence from the bath. In cases where there is some weakness of the vital functions, as in childhood and old persons, and in the anæmic, the reaction does not occur, owing to the predominating action of the cold. The author will probably have few imitators, but his experience may serve to neutralize some of the unreasoning prejudice against cold bathing.

Typhoid Fever.—A. Vogl[191 Feb.] presents a number of "Aphorisms on Hydrotherapy in Typhoid Fever," which are so practical that we quote them in full: 1. As an antipyretic, the object to be obtained by this treatment is, that the evening temperature of the patient on the day of his admission shall represent the acme of the entire subsequent course of temperature, *i.e.*, that it shall not advance beyond this point on any other day of the disease. 2. This is accomplished in such manner that the abrupt and persistent rise of temperature is interrupted by the systematic abstraction of heat. If a bath is administered as soon as the thermometer registers in the rectum 39° C. (102.2° F.) or more, the fever will never rise to the initial temperature (usually 40° C.—104° F.—and over). 3. Aside from this, by the repetition of the baths, the resistance of the organism to the cooling procedure is gradually overcome. The effects of the baths become more and more pronounced, *i.e.*, the exacerbations and remissions are brought to a lower level, as well as the average temperature. 4. In this way we are able to control the course of temperature, and this will be manifested more positively and strikingly in the mild than the severe cases, and in the former a progressive daily reduction of fever is brought about from the very first day. 5. Even in the severe cases, however, by initiating this treatment at the proper time and carrying it out energetically, we are able to so regulate the temperature that after the first day it never reaches the same level during the entire course of the disease; and it is possible, under the influence of a rational employment of the baths, to secure a reduction of fever from week to week. 6. Of equal importance with this gradual reduction of fever, although not sufficiently appreciated when comparing this method with other antithermic procedures, is the fact that, when under the influence of systematic hydrotherapy, the patient presents, for two or three hours after the bath, a more or less reduced temperature-level, until another exacerbation occurs, which is at once checked by another bath. Hence, the patient is under the influence of a maximum temperature for only a short period. This constant and certain moderation of the temperature comprises the thermic effect of the bath treatment. 7. In addition to this, the direct consequences of the pyrexia are not only alleviated, but also the intensity of the local and general symptoms of infection. From the very first day there takes place, in connection with the fall of temperature, a change in the picture of the disease,—the status typhosus is eliminated from it. 8. Intimately connected with this conversion of a severe into a less severe or even mild course of the disease is the reduction of mortality, which has been satisfactorily demonstrated in thousands of cases, both in this country and in Europe. The method has been proved to be entirely free from danger. 9. The objections to the use of medicinal antipyresis in typhoid fever are: (1) this method has a slighter *total* thermic effect, because the marked remissions of temperature obtained are neutralized by a high degree of subsequent exacerbation; (2) it is, therefore, incapable of effecting a reduction of fever from day to day, the patient presenting the same or much higher temperatures in the second or third week than on the day of admission; (3) it is usually devoid of any favorable action upon the local and general symptoms, and, since it has no influence upon the course of the disease, the mortality is as great under its use as where an expectant plan has been pursued; (4) it is not free from danger, owing to its debilitating effects.

J. C. Wilson[9 Dec. 4, '90] furnishes the results in 64 cases of typhoid fever treated at the German Hospital of Philadelphia since February 1, 1890, by himself and Trau and Wolff, by the cold bath, according to Brand, without a death. In reply to those who have questioned the statistics, he stated that a large number of independent observers have fully confirmed the general results obtained by Brand. The objections urged by some that the typhoid fever of this country is not sufficiently severe to demand so radical a treatment, and that patients in this country do not bear cold bathing as well as the French and Germans, he disproves by his own statistics. Furthermore, he insists that it is impossible to foresee the severity of any particular case at the outset of its course, and that the treatment by the method of Brand tends to make every case a curable one. It is true that certain cases do not react promptly, and that women react less promptly and less satisfactorily than men. In no case in the author's series, however, did the delay in reaction, after the patient was put to bed, cause the slightest apprehension on the part of the attendants. It has been claimed that this treatment is inconvenient, and demands an amount of experience and labor on the part of the attendants not easily to be had in private practice and in some public institutions, and that the opposition of the patients themselves and of their friends is an obstacle to any attempt on the part of medical men to introduce the treatment into private practice. This is a difficulty that will vanish as soon as the profession generally recognizes the method as an efficient means of saving many lives, and lends its weight to the advocacy of the plan among the people.

Demme,[650 Jan. 1] in the report of the Children's Hospital, at Berne, states that in the acute fevers of children, moderately high temperatures (101.3° to 103° F.—38.6° to 39.5° C.) lasting but a few days are best treated without recourse to any medicinal antipyretic. He believes that such cases are best managed by means of wet cloths wrapped around the body and methodically renewed every two hours. It was found that the nervous excitement and restlessness accompanying these moderate temperatures, and the wakefulness not infrequently present, are most successfully combated by one or two lukewarm baths daily, the temperature of the water being 78.8° to 82.4° F. (26° to 28° C.), and the child kept in the bath for five or ten minutes. It is only when the fever-heat ascends to 104° F. (40° C.) or upward, and remains for some time at that point, that the employment of an antipyretic is advisable. In his opinion, antipyretics are most suitable in typhoid fever, acute articular rheumatism, and obstinate progressive broncho-pneumonia; but should be avoided, or at least used only exceptionally, in diphtheria, the acute exanthems, and simple croupous pneumonia. Refrigerant baths are seldom employed by him in place of tepid baths. When there is a tendency to stupor, or the face is of a deep-red or cyanotic hue, it is his custom, while the patient is in the bath, to make use of intermittent affusion of the head and neck with water 5.4° to 7.2° F. (3° to 4° C.) cooler than that of the bath. Kurkutoff,[6, May] who has studied the physiological effects of baths administered to typhoid-fever patients in Manassein's clinic, in St. Petersburg, finds that such baths exert only a slight effect on the assimilation of the fatty constituents of foods, which, as in other fevers, is noticeably less in healthy persons, and varies directly with the gravity of the case. In the graver cases the assimilation of fat was improved to the average extent of nearly 4 per cent. In slight cases, however, the effect was, apparently at least, to diminish the assimilation to the average extent of rather more than 6 per cent.

Measles.—J. Fodor[1001, July] has successfully treated 36 cases of measles in children in the following manner: The entire body of the child was immersed in cold water, rubbed with a moist sponge, and the trunk was covered with a cloth wrung dry out of cold water. This procedure reduced the fever, invigorated the nervous system and heart-action, improved the digestion, and induced sleep, while favoring the elimination of toxines. The ablutions should be made every hour if the temperature rises above 39° C. (102.2° F.), but only once at night. Even after disappearance of the fever the skin should be freed of excretory matter and its susceptibility to changes of temperature reduced by cold or warm baths, and in this way the development of sequelæ prevented. Guinon believes that in the eruptive fevers hydrotherapy affords better means of controlling the pyrexia and the accompanying nervous phenomena than treatment by antipyretic remedies. In scarlatina, when the temperature is high, he strongly advocates cold affusions, which must sometimes be repeated six to eight times a day. If the fever persists, the cold bath is called into requisition, but its duration should not exceed five or ten minutes, to avoid collapse. In malignant measles with hyperpyrexia, hydrotherapy is, in his estimation, our only refuge. The cold bath should be employed, but, if there is an adynamic condition, cold affusions are serviceable. Pulmonary congestion and broncho-pneumonia are also favorably influenced by baths, the water being gradually cooled, while cold water is poured on the head if there is fear of meningeal complications. In variola the cold bath is eminently useful to moderate the suppuration and fever and relieve the nervous phenomena; tepid baths alleviate the pain and warm baths cleanse the skin. An antiseptic, such as corrosive sublimate, may sometimes be added with advantage to the water. In cases of sudden danger cold affusions are recommended.

Pneumonia.—An editorial article[191, Mar.] concludes with the statement that every indication in the treatment of *pneumonia* is fully met by the cool bath, properly adapted to the conditions of each case, viz., (1) to reduce the temperature; (2) to tone up the action of the heart; (3) to refresh the failing nerve-supply of the heart and lungs; (4) to deepen the respiration; (5) to enlarge the surface area of the blood; (6) to restore the lost tone of the capillaries. W. S. Fenwick[6, Jan. 31, Feb. 7] presents an analysis of 1000 cases of pneumonia treated in the London Hospital during the decade ending 1890. Of these, 108 cases were treated by the application of cold in various ways. In 52 cases, half of which were treated with cold applications to the chest and the other half with the cold-pack, the mortality was about 15 per cent. Cold sponging was used in 65 cases, with a mortality of 13 per cent. The ice-cradle was made use of in 43 cases, with a mortality of 7 per cent. Taken altogether, there were 108 cases treated by the application of cold in various ways, with a mortality of 10 per cent., the mortality by the other methods being more than double that by the cold treatment. With the latter treatment stimulants were also usually given. Fenwick found that the other antipyretics acted more or less as cardiac depressants, and that the use of cold was free from this objection, while more potent than other agents in reducing temperature. C. T. Williams[2, Mar. 28] has also found the cold bath an efficient means of reducing the temperature. In 2 cases thus treated the bath not only decided antipyresis, but also improvement in the appetite, strength, breathing, and physical signs was produced, the pyrexia gradually subsiding. Good results were also obtained from tepid sponging of the body and the use of an ice-bag for a few hours each day whenever the temperature rose above 100° F. (37.8° C.).

Respiratory Diseases.—Baruch[1, Aug. 15] reports several cases of phthisis treated at the Montefiori Home for Chronic Invalids with tuberculin, codliver-oil, creasote, and hydrotherapeutic measures. He found that the cases were not benefited by the tuberculin injections, while hydriatic treatment, in connection with the above drugs, effected marked improvement, 3 cases returning to work with a gain of flesh—from 6 to 30 pounds—and disappearance of all symptoms. S. Baum[1001, Jan.] has witnessed strikingly successful results from hydriatic treatment in diseases of the respiratory organs of infants. He cites a number of cases of severe broncho-pneumonia, following measles and pertussis, in which the use of baths (of a temperature of about 80° F. (26.7° C.) and cold compresses effected rapid recovery. He believes that the bronchitis of nursing infants is most susceptible to hydrotherapy. He refers to the prejudices against cold compresses in the bronchitis of measles, but claims that their application would prevent broncho-pneumonia. An editorial article,[191, Sept.] commenting on these facts, closes with the following words: "The personal experience of the writer is entirely in accord with the view that, in the broncho-pneumonia of children, no treatment yet devised appears as judicious as applications of wet compresses, baths, and affusions. It may be unfortunate that so much prejudice exists against it, but, when it is considered how little the *rationale* and the method of application are understood, we must recognize in this prejudice one of those happy conservative agencies which the physician encounters none too frequently."

Rheumatism.—H. C. Male[15, May] regards it as abundantly proved that excessive rises in temperature—in rheumatism, at all events—cannot be kept in check by drugs alone. He reports a case in which the cold-pack and the spinal ice-bag had a marked effect in reducing the high temperature of 107° to 110° F. (41.7° to 43.3° C.) on each of the eight occasions on which they were used, although large doses of various antipyretic drugs had proved unavailing.

On the discontinuance of the treatment there followed a rapid rise of temperature, with exaggeration of all the symptoms, until the fatal termination. Previous to the onset of hyperpyrexia the patient's strength was nearly exhausted. He had been ill for over five weeks, with constant pain and want of sleep, and pericarditis had existed long enough to cause such local organic changes as seriously hampered the action of his heart. The author impresses upon us the necessity of making a most careful record of temperature in all cases of acute rheumatism and of recognizing at once the earliest signs of approaching hyperpyrexia. Should the temperature show an undue rise, we should not waste valuable time by the administration of drugs, but endeavor to check it at once by the prompt application of cold. The result of such treatment in a favorable case is most gratifying. The patient may be dying from excess of temperature one hour and the next may be in comparative comfort, and with prospects of a speedy recovery. One bathing has frequently turned the scale. The treatment may be applied readily, both in private and in hospital practice, and should not be withheld from any patient, in whatever circumstances he may be placed.

Heat-Stroke.—Illoway $^{9}_{\text{Aug. 3}}$ expresses his preference for the wet-pack over the cold bath in the treatment of this condition, on the ground that it is a more powerful agent for the abstraction of heat. He says that "it is true that the cold bath produces a marked and rapid lowering of the temperature, but this effect is not permanent, and after a longer or shorter period of time the temperature again rises, frequently to its previous height. The cold bath must then be repeated. The question that has presented itself to me is, whether the shocks to the system, consequent upon the use of the cold baths, may not have some deleterious action upon the organism. The wet-pack does not produce so rapid a depression of the temperature, but, on the other hand, if applied as here detailed, it is not followed by a secondary elevation; the heat is abstracted gradually, but continuously, and, in the time required for this gradual abstraction, the system has accommodated itself to the changed condition." His method of applying was as follows: A large muslin sheet was wrung out of cold water; the naked child was wrapped in the sheet, placed in its bed or cradle, and covered with a blanket. As soon as the sheet became warm it was removed and replaced by another that had meanwhile been cooling in the water. This procedure was continued until the temperature reached the normal.

Chronic Diseases.—In an editorial article[191 Oct] on the management of chronic diseases the writer adduces the testimony of Ziemssen, Hoffmann, and Dujardin-Beaumetz as to the value of hydrotherapy, which is in conformity with his personal observation in private and hospital cases. He believes that no case of chronic disease should be regarded as hopeless until a cautious and judiciously-planned hydrotherapy has been fairly tried. Our most marked results have been obtained in inveterate rheumatic and gouty affections, in diseases of the digestive tract, in functional nervous troubles, and in the early stages of phthisis.

Cardiac Troubles.—W. Winternitz[1001 Oct] strongly advocates the ice-bag and cold-coil in cardiac affections. His conclusions, which are based upon an extensive experience, are as follow: 1. The application of cold to the cardiac region diminishes the temperature of the pericardial cavity and of the heart, and is, therefore, useful in inflammatory conditions of these organs. 2. Inasmuch as it reduces the temperature of the blood, this method is serviceable in fevers, as an auxiliary to other antithermic methods. In conjunction with antipyretic remedies, the ice-bag has the special advantage of counteracting the damage inflicted by all other antipyretics upon the heart and vascular tonicity. 3. In all conditions of debility of the heart the use of the ice-bag is indicated. 4. In all conditions where the blood-pressure is reduced the ice-bag is beneficial,—that is, in all severe circulatory disturbances, adynamic fevers, non-compensated cardiac lesions, or functional cardiac diseases. 5. Inasmuch as it relieves the pulmonary circulation, the application of cold over the cardiac region is advantageous in all congestive conditions of the lungs, bronchorrhagia, hæmoptysis, and bronchial catarrh due to stasis. The sole contra-indication is a far-advanced fatty degeneration of the cardiac muscle, such as exists in the last stage of cardiac troubles, in diabetes, and nephritis. 6. If the irritation produced by the ice-bag, in consequence of its low temperature, is too great, it may be replaced by a coil of rubber tubing, through which cold water is allowed to flow. A handkerchief is folded fourfold and placed over the heart-region; over this is laid the rubber coil, and then the front of the chest is covered with a dry cloth. The cooling process is resorted to twice daily, the sittings lasting from one to two hours.

Gastric Troubles.—W. Winternitz[1001 May] describes a new method of treating diseases of the stomach, which he employed successfully in a case of neurasthenia with severe dyspeptic symptoms, and in several cases of nervous dyspepsia and anæmia attended with cardialgia. The manner of application was as follows: The patient was placed on her back, and covered with a sheet well wrung out of cold water (from the armpits to the knees). Before covering this with a dry sheet, as is usually done, a coil of rubber tubing was applied to the epigastrium, through which a current of warm water at a temperature of 122° F. (50° C.) was passed. This procedure was employed for half an hour before each meal during a number of weeks, and permanently relieved the vomiting and other distressing symptoms. The new method is indicated in most cases of nervous dyspepsia, in chronic gastric catarrh, alcoholic gastritis, and congestive conditions of the stomach, hyperacidity, cardialgia, and obstinate vomiting. Its effects are different from the hot- or cold- pack when employed alone. The application of the hot-coil over the cold-pack probably increases the stimulating effect of the latter, even when the skin is anæmic. In consequence of this, the circulation in the gastric mucous membrane, the innervation, secretion, and motor functions are favorably influenced in cases where the cold-pack is contra-indicated.

Nervous Diseases.—Dana[191 Dec.,'94] says that, in neurasthenia, wet-packs and half-baths, followed by shower, jet, or plunge are often prescribed. In weak, sensitive, and anæmic women he employs first dry hot-packs for a week, then wet-packs, and, finally, the drip-sheet or cool shower. In epilepsy dry- and wet- packs may be given, but the best method for a fairly robust person consists in giving simultaneously the rain-shower and the jet. The person standing in the shower receives a jet of water on the posterior surface of the body for fifteen seconds; then the jet alone for fifteen seconds; finally, the jet alone on the anterior surface of the body for thirty seconds. In hysteria the rain-shower and the jet are usually most efficacious. In locomotor ataxia lukewarm baths, with pine-needle extract, or half-baths with affusion are indicated. Hot sand- or water- bags are sometimes applied continuously to the spine for one or two hours, with the purpose of increasing the temperature and circulatory activity of the cord. In peripheral pains from neuritis or neuralgia the continuous application of ice-bags is often efficacious. R. von Hoesslin[870, Oct. 16] makes a plea for the cold-water treatment of spinal diseases. He has observed unfavorable effects from the use of hot or warm baths, but frequently obtained excellent results from cold applications. He is especially impressed with the value of cold affusion to the lower extremities, these parts having been previously warmed by the hot-pack or by steam-baths. The cold should not be applied for more than a minute, after which the parts are dried and covered for half an hour with dry blankets. In many cases a reaction could no longer be obtained after daily employment of the baths for two or three weeks, and then other hydropathic measures were resorted to, such as cool sitz- or full- baths, cold affusion to the back, having the same duration as the above, returning later to the first-described method. This treatment has proved especially efficacious in tabes and multiple and lateral spinal sclerosis.

In Labor.—Pingler[1001, Sept.] has employed the cold sitz-bath after delivery since 1850 in about 2000 cases, and has found that it is a sure preventive of many of the complications of the puerperal state. Under its use constriction of the uterus is secured, hæmorrhage and puerperal sepsis are prevented, and the expulsion of the placenta is favored, even when it is slightly adherent. In the practice of Thewald and Fresemies and of two midwives the cold bath has been equally serviceable. The method of employment is as follows: As soon as the expulsion of the placenta has occurred, the woman is placed in a sitz-bath having a temperature of 50° F. (10° C.). She should be well covered, and the nurse's hand should be introduced under the bed-clothes, and the lower part of the back and abdomen and the thighs briskly rubbed, while the external genitals are douched with water having the same temperature as the bath. A marked reaction can usually be brought about in five to ten minutes. After her removal from the bath the patient is rubbed thoroughly dry and covered with blankets. The stimulating effects thus secured persist for a number of days, and by this means the exhaustion after delivery, in nervous or anæmic women, is prevented, and the duration of the puerperal state greatly shortened. If, for any reason, the sitz-bath cannot be employed, the woman may be placed on a narrow board laid across an empty vessel, and the back and lower abdomen douched with cold water until the uterus has firmly contracted. She is then rubbed thoroughly dry and well covered with bed-clothes.

Durand Fardel[67 Feb.] holds that the application of cold water alone is the aim of hydrotherapy. This singular idea he endeavors to sustain by demonstrating that the physiological and therapeutic effects of hot water are distinct from those of cold water, and by claiming that to disregard cold in hydrotherapy is to forget the significance of the word " hot " in speaking of fire (!). While it is true that " to produce a sedative effect upon the system warm-water application should be employed," we do not recognize the application of this or any of the claims of this author in support of the limitation of hydrotherapy to cold water alone. The word is derived from the Greek ὕδωρ (water) and θεοαχεωο (to heal). Hence it applies to the use of water in any form, at any temperature, and by any method in the treatment of disease. The idea that it applies only to cold water arises from the almost universal application of cold water alone by the empirics calling themselves hydropaths, water-cure doctors.[191 July]

M. Herz[169 Feb.] has obtained excellent results in various diseases from the use of " Gaertner's local steam-bath." This apparatus consists of a kettle, under which is placed an alcohol-lamp or gas-jet, and a series of metal tubes, jointed at different angles, which conduct the steam to a tent placed in the bed of the patient. The kettle is provided with a funnel, into which the water is poured, and which acts at the same time as a safety-valve. At the place where the tube is joined to the kettle a diaphragm is attached, by which the supply of steam can be regulated. The author has found that, when applied to different parts of the body, these local baths relieve pain and subdue inflammations. They are directly curative in traumatic inflammations of joints. In acute and subacute rheumatism they are valuable auxiliaries to other measures (salicylates, massage). In chronic cases acute exacerbations could be prevented by its employment. A general steam-bath is also of value in œdema and uræmia of nephritic origin. As regards the contra-indications to the bath, the author states that if only a small portion of the body is subjected to its action the objections to its use can only be based upon the local conditions present, for its general effects are so slight that they need not be taken into account, and can be easily prevented by cold applications to the head. When the bath is employed, however, over larger surfaces of the body, it will be necessary to determine carefully in each case whether it should be hot or merely warm, and whether it should be kept up for a long or short time. We should be governed in this respect by the effect we desire to obtain,—either an irritation, an increase of the temperature, or a profuse perspiration,—and the contra-indications may be the condition of the nervous system, the heart, the vascular system, and the lungs.

Enteroclysms.—Although he is a warm advocate of the bath treatment, Cantani[169, Feb.] regards slight reductions of temperature as preferable, in many cases, to marked antipyresis produced by a cold bath. During many years he has obtained this result by letting the patient drink large quantities of cold water, and administering, at least twice daily, a large enema of some cold, slightly antiseptic solution. The same method of antipyresis is not equally efficient in all cases of fever; in typhus, for example, the most marked reductions of temperature are obtained by the drinking of large amounts of cold water, whilst in typhoid cold enteroclysms yield better results. In typhus the patient is given from 5 to 6 quarts and sometimes even 8 quarts of cold water during the twenty-four hours, and the windows of the room are kept open day and night. In some of the cases the duration of the disease was markedly shortened, the temperature in 1 case being reduced from 41° to 37° C. (105.8° to 98.6° F.) on the eighth day. In typhoid fever large quantities of cold water are introduced into the bowel, and the effect supplemented by letting the patient drink as much as possible of cold water. It was found, by a large number of observations, that after each enteroclysm of 2 quarts of water the temperature fell 0.6° to 0.8° C. (1.08° to 1.44° F.) in the axilla, and this reduction was maintained for two, three, or more hours. The water injected, which had a temperature of 11° C. (51.5° F.), was usually evacuated in ten to thirty minutes, and then had acquired a temperature of 35° to 37° C. (95° to 98.6° F.). The author believes that, in typhoid fever, if enteroclysis is employed at the commencement, it is possible, in the majority of cases, to abort the disease. The fact that the quantity of the urine is increased and its specific gravity diminished proves that the cold water is absorbed in large quantities, and permeates and cleanses the tissues. The internal organs are cooled and freed of ptomaines, and this takes place without disturbances of any kind, except occasionally a slight chill. B. Robinson[59, July 11] has resorted to Debove's plan of administering large quantities of cold water to typhoid patients. He employed it in 3 cases of moderate severity with excellent results; in a fourth, and more severe case, it was used in conjunction with the cold bath. All the patients recovered without complications. The author urges the adoption of this treatment as a substitute for, or auxiliary of, the Brand method.

Internal Lavage of the Body.—Under this name Sahli[100, June] describes a method which consists in the hypodermatic injection of a large quantity of a physiological solution of sodium chloride, of a strength of 0.6 to 0.7 per cent., and of the temperature of the body, under the skin of the abdomen, thighs, or gluteal regions, with a metallic cannula, utilizing simply the atmospheric pressure. These injections, which are generally attended with little pain, are repeated more or less frequently, according to the nature of the case. They may be made every day or even twice a day, a litre (1 quart) of the above solution being injected at each sitting. Under the influence of these injections there is produced an abundant diuresis, with augmentation not only of fluid in the urine, but also of the solid constituents; this is not always observed, and the curative effects are then due to the augmentation of the blood-pressure, the saturation of the tissues which are desiccated in certain diseases with water, and, finally, the great dilution to which toxic substances in the organism are subjected. The most active effects of the injections have been observed by Sahli in the treatment of the typhoid state and uræmia. They are said to be contra-indicated (1) in cases of pulmonary œdema, or where this condition is likely to occur, and (2) in cases of considerable dropsy with cardiac failure. In dropsy of moderate extent, however, such as we meet with in interstitial nephritis and in certain forms of scarlatinal nephritis, the hypodermatic injections of water may sometimes be employed with advantage.

HYGIENE AND EPIDEMIOLOGY.

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HYGIENE.

General Considerations.—The most notable sanitary event of the year was the Seventh International Congress of Hygiene and Demography, held in London, August 10th to 17th. The Congress was conducted in ten sections, viz.: (1) Preventive Medicine; (2) Bacteriology; (3) The Relation of the Diseases of Animals to those of Man; (4) Infancy, Childhood, and School Life; (5) Chemistry and Physics in Relation to Hygiene; (6) Architecture in Relation to Hygiene; (7) Engineering in Relation to Hygiene; (8) Naval and Military Hygiene; (9) State Hygiene; and (10) Demography, Health Statistics, Industrial Hygiene.

Sir Joseph Fayrer, President of the Section of Preventive Medicine,[2 Aug.15] in his address, showing the effect of sanitary work, called attention to the decreased death-rate of England, as follows:—

1660–79,	80 0 per 1000.
1681–90,	42.1 "
1746–55,	35 5 "
1846-55,	24.9 "
1866-70,	22.4 "
1870–75,	20.9 "
1875-80,	20.0 "
1880-85,	19.3 "
1885-88,	18.7 "
1889,	17.85 "

"In some parts of England, where the main object is the recovery or the maintenance of health, the death-rate is down to

9 per 1000; while in others, where the main object is manufacture and money-making, it is as high as 30 per 1000."

"Recent Sanitary Legislation in England" was the subject of an address by Joseph Ewart,[2, Nov. 29, '90] in which he referred to the Notification of Infectious Diseases Act of 1890, which, though permissive, and before the passing of this act carried out in fifty-six sanitary districts, with a population of nearly 4,000,000, had already been adopted by others with a population of 12,000,000. Being compulsory in the metropolis (London), its benefits were now extended to 20,000,000, or four-fifths of the total population of England and Wales. Besides the diseases specified in the act, it was made optional with the authorities to include others, as measles and whooping-cough. Another act, that for the prevention of infectious diseases, passed in August, 1890, could not fail to be productive of incalculable benefits if adopted in its entirety, but, unfortunately, its application, except as regards London, is merely permissive. The Housing of the Working Classes Act, 1890, is a fairly successful attempt to consolidate thirteen acts and parts of two others, extending them also to Scotland and Ireland.

The decline in the general death-rate of the country from 22.42 per 1000 in 1866–70 to 17.9 in 1890 is evidence of the benefits accruing from the working of the Public Health and other sanitary acts, as is also the immunity enjoyed from cholera; and it is not utopian to hope that a general and energetic enforcement of the powers conferred by these acts and the Public Health Amendment Act of 1890 may, ere long, reduce the death-rate to 12 or even 10 per 1000, with a corresponding improvement in the material, social, and moral welfare of the masses.

D. Biddle,[22, Oct. 14] in an article on "Infectious Diseases," publishes diagrams illustrative of the effect in past years of the compulsory notification and isolation, and states that the towns under the dual system are the very towns which have improved the least.

In an editorial[22, Oct. 21] the statement is made that the system of compulsory notification must fail and has always failed to limit the dissemination of disease, and that the more that system is extended the larger will the zymotic death-rate become.

W. Ogle $^{2}_{\text{Aug.15}}$ gives the following tables of comparative mortalities of men between 25 and 65 years of age in different occupations; the death-rate of clergymen, the lowest of all, being taken as a standard of comparison, and represented by 100:—

COMPARATIVE MORTALITY OF MEN 25 TO 65 YEARS OF AGE IN DIFFERENT OCCUPATIONS DURING 1881, 1882, AND 1883.

OCCUPATION.	Comparative Mortality.	OCCUPATION.	Comparative Mortality.
Clergymen, priests, ministers	100	Carpenters, joiners	148
Lawyers	152	Cabinet-makers, upholsterers	173
Medical men	202	Plumbers, painters, glaziers	216
Gardeners	108	Blacksmiths	175
Farmers	114	Engine-, machine-, boiler-makers	155
Agricultural laborers	126	Silk manufacture	152
Fishermen	143	Wool, worsted manufacture	186
Commercial clerks	179	Cotton manufacture	196
Commercial travelers	171	Cutlers, scissors-makers	229
Inn-keepers, liquor-dealers	274	Gunsmiths	186
Inn and hotel service	397	File-makers	300
Brewers	245	Paper-makers	129
Butchers	211	Glass-workers	214
Bakers	172	Earthenware-makers	314
Corn-millers	172	Coal-miners	160
Grocers	139	Stone- and slate-quarriers	202
Drapers	159	Cab and omnibus service	267
Shop-keepers generally	158	Railway-, road-, clay-, and other laborers	185
Tailors	189	Costermongers, hawkers, street-sellers	338
Shoe-makers	166	Cornish miners	331
Hatters	192		
Printers	193		
Book-binders	210		
Builders, masons, bricklayers	174		

COMPARATIVE MORTALITY OF MEN WORKING IN AIR OF DIFFERENT DEGREES OF PURITY FROM PHTHISIS AND RESPIRATORY DISEASES.

AIR.	OCCUPATION.	Comparative Mortality from		
		Phthisis.	Diseases of Respiratory Organs.	Phthisis and Diseases of the Respiratory Organs.
Pure	Fishermen	55	45	100
	Farmers	52	50	102
	Gardeners	61	56	117
	Agricultural laborers	62	79	141
Confined	Grocers	84	59	143
	Drapers	152	65	217
Highly Vitiated.	Tailors	144	94	238
	Printers	233	84	317

COMPARATIVE MORTALITY OF MALES IN CERTAIN DUST-INHALING OCCUPATIONS FROM PHTHISIS AND DISEASES OF THE RESPIRATORY ORGANS.

OCCUPATION.	Comparative Mortality from		
	Phthisis.	Diseases of Respiratory Organs.	Phthisis and Diseases of the Respiratory Organs.
Coal-miners	64	102	166
Carpenters, joiners	103	67	170
Bakers	107	94	201
Masons, brick-layers, builders.	127	102	229
Wool- and worsted- workers	130	104	234
Cotton-workers	137	137	274
Quarrymen	156	138	294
Cutlers	187	197	384
File-makers	219	177	396
Earthenware-makers.	239	326	565
Cornish miners	349	231	580
Fishermen.	55	45	100

Bahadurji, of Bombay,[2, Aug. 22] calls attention to the necessity for the systematic examination of town and city air by chemical and bacteriological methods, and contends that the results would be of great value in determining the incidence of disease.

LIGHT.

The comparative mortality in the United States from the different illuminating gases (when breathed unconsumed) is the subject of an article by Samuel W. Abbott,[2, Oct. 10] who says that, previous to 1878, coal-gas was very generally employed in all large cities for illuminating purposes, and before that date fatal accidents from asphyxia, due to breathing coal-gas, were of very rare occurrence. Water-gas was first introduced extensively about 1878, in the city of New York, and other cities soon adopted it. In the three large cities of New York, Brooklyn, and Baltimore there had been 16 cases of reported deaths from asphyxia by illuminating gas in thirteen years previous to the introduction of water-gas, or an average of but little more than 1 in each year. In the seven years and six months following its introduction the deaths from this cause in these cities were 120, or 16 per year. The number of deaths from this cause in New York in later years was about 25 or 30 annually. Massachusetts formerly had a law which practically prohibited the manufacture of water-gas; that is to say, any gas containing more than 10 per cent. of carbonic oxide. The average ratio of the carbonic oxide in ordinary coal-gas is about 6 to 7 per cent., while the carbonic oxide in water-gas ranges from 25 to 30 per cent. After five or six years the advocates of water-gas succeeded in having the Legislature repeal the 10-per-cent. law, and, as a result, in the city of Boston alone, having about 450,000 population, the number of deaths from this cause in the single year 1890 was greater than the entire number of deaths from the same cause in the fifty years previous to the introduction of water-gas. In the year 1889 the number of deaths found to have occurred in the United States was 107, of which number 30 were probably suicides and 77 were accidental. These figures are the result of voluntary reports, and it is possible there may have been more deaths from the same cause, there being in many States of the Union no compulsory registration of deaths. The 77 accidental deaths occurred in twenty-two cities and towns.

HEATING AND VENTILATION.

Ventilation by Heat.—W. P. Buchan, of Glasgow,[159] Dec. 20, '90 tested the speed of air up the ventilating pipe from the ceiling of a church. The vertical part of this pipe was about 40 feet high, and its diameter 18 inches. Near to its bottom there was a small circular gas-tube, with a provision for lighting a dozen gas-jets when desired. He first tested the ventilating pipe without the gas being lighted, when the speed indicated 160 linear feet per minute. With the gas lighted, the speed rose to 300 linear feet per minute, showing that the heat of the gas gave considerable increase of up-current. The question then occurred, would the speed be still further increased by suspending a piece of pipe of thin sheet-iron a little above the gas-jets, so that when the jets were lighted they would heat this tube, and so increase the up-current? As the result of a number of experiments it was found that, in order to get the full value of the heat and conserve it for the up-current, while it was serviceable to wrap asbestos or felt around the outside of the pipe, the suspension of large concentric pipes or plates inside the outlet ventilating pipe appeared to be useless. They retard the up-current, and so harm the ventilation, whether the gas is lighted below them or not. The loss of speed in the upper current when the inner tube or plate is suspended in the ventilating pipe above the gas he attributes to extra friction.

George Hay, of Pittsburgh,[161] Feb. states that, as a consequence of the increasing scarcity of natural gas, there are at present in the market various devices for the purpose of using this gas with economy as a means of heating. He mentions three different devices, in all of which the products of combustion are discharged into the atmosphere of the room, and calls attention to the deleterious effect therefrom. "Natural gas," he states, "is, for all practical purposes, what is known to miners as *fire-damp* and to chemists as marsh-gas, light carburetted hydrogen, or methyl hydride. . . . One volume of marsh-gas in burning consumes two volumes of oxygen, and produces one volume of carbonic acid and two volumes of water-vapor. Therefore, if a stove consumes 10 cubic feet of natural gas per hour, in a room containing 1000 cubic feet of air, there are thrown into the atmosphere of that room 10 cubic feet per hour of carbonic acid and 20 cubic feet of water-vapor. Now, the 10 cubic feet of natural gas removes 20 cubic feet of oxygen from the air of the room, and, as air contains only 20 per cent. of its volume of oxygen, the remainder being mainly the inert gas-nitrogen, it follows that, in this instance, 100 cubic feet (or 10 per cent.) of the air of this room are vitally destroyed in one hour. Suppose that there were no transpiration of air, we should have in one hour an atmosphere containing 1 per cent. of carbonic acid,"—in the writer's opinion, a poisonous quantity. "Ordinary air contains, on an average, only 1 part by volume of carbonic acid in 2000 parts of air inland, while over the ocean, according to Beauvais, there is merely a trace of this noxious gas; but when the proportion is raised to 1 part in 100, then there is danger."

AIR.

Seneca Egbert,[112 Feb.] in an article "On the Determination of the Carbon Dioxide Present in Air," describes an apparatus recently suggested by J. Rosenthal, of Erlangen, and suggests a method by which any intelligent physician can quickly, and with slight expense, make an approximate determination of the same. Rosenthal's method consists simply in drawing the air to be examined through a given quantity of a milli-normal sodium-carbonate solution, which requires a certain exact volume of carbon dioxide to neutralize it, and of then collecting and measuring the air thus deprived of its carbon dioxide. In the alkaline solution a small quantity of phenol phthaleine is used as an indicator, its color being destroyed as soon as the solution becomes the least acid. If, now, when this loss of color occurs, we can know the amount of air that has passed through the liquid, we can know also the percentage of carbon dioxide it contained, for, of necessity, it held the exact quantity of the gas that was required to neutralize the alkali. It has been found by experiment that it requires just 3 cubic centimetres (¾ drachm) of carbon dioxide to neutralize the alkalinity and decolorize 20 cubic centimetres (5¼ drachms) of a milli-normal solution prepared in the manner described below. Consequently, the quantity of air used being known, the percentage of dioxide will be equal to 3 (the number of cubic centimetres of CO_2 needed to neutralize the alkali) divided by the number of cubic centimetres of air used and multiplied by 100. The alkaline solution is prepared as follows: "5.3 grammes (1⅛ drachms) of dry sodium carbonate, free from water of crystallization, and 1 gramme (15½ grains) of phenol phthaleine are dissolved in nearly a litre (1 quart) of distilled water (which has been previously boiled to drive off the carbon dioxide) and, after cooling, brought up to 1 litre (1 quart) by the addition of more boiled and distilled water. This deci-normal solution must be kept in a well-stoppered flask. A fresh milli-normal solution is made each time that the apparatus is to be used by diluting 10 cubic centimetres (2½ drachms) of this stock deci-normal solution to 1 litre (1 quart) with previously boiled and cooled distilled water, the quantity thus prepared being sufficient for fifty successive tests. The milli-normal solution should be made fresh for each series of tests, as it absorbs enough acid from the air to absorb its alkalinity if allowed to stand for any length of time. Of the milli-normal solution, described above, 20 cubic centimetres (5¼ drachms) require just 3 cubic centimetres (¾ drachm) of carbon dioxide to destroy the alkalinity and decolorize it; consequently, each cubic centimetre (15½ minims) of solution decolorized will indicate 0.15 cubic centimetre (2⅜ minims) carbon dioxide. If, now, we take a clean glass jar, preferably a wide-mouthed one, holding at least a litre (1 quart), and, after determining its capacity in cubic centimetres, introduce into it 1 cubic centimetre (15½ minims) of the solution at a time, shaking the jar after each addition, the number of cubic centimetres of the solution decolorized multiplied by 0.15 will represent the number of cubic centimetres of carbon dioxide present in the air in the jar; provided we prevent the entrance or escape of air during the process." By this means the percentage of carbon dioxide in the air tested will be represented by

$$\frac{\text{the no. of c.c. of solution decolorized} \times 0.15 \times 100}{\text{the capacity of jar in c.c.}}$$

In a paper read before the International Congress of Hygiene and Demography, upon the "Effects of Carbonic Acid on Man," W. Marcet[22, Oct.14] shows that on the top of a mountain there is less CO_2 in a cloud or fog than in fine, clear weather, but the very reverse takes place in large towns in foggy weather. When the streets of London are obscured by a dense autumnal fog the atmosphere CO_2 is greatly increased. This is due to the carbonic acid generated in towns being absorbed by fogs, while the diffusion of the gas is much less rapid through fog than through the atmosphere when clear. The effects produced on the chemical phenomena of respiration by re-breathing 35 litres (35 quarts) of air in a closed vessel during five minutes have passed away in less than six minutes after the breathing of fresh air has been resumed, and a practical deduction is, that people who are called upon to make a prolonged stay in ill-ventilated apartments should go into the open air as often as possible, if only for a few moments, and should sleep in well-ventilated rooms.

SOIL.

Justin Karlinski, of Konjica, Herzegovina,[6, Apr.18] states that, in the natural process of decomposition after burial in the earth, the putrefactive process is accompanied by a rise of temperature above that of the circumjacent soil; and, also, that this rise in temperature is markedly higher when the parts examined have been taken from the bodies of men or animals who have succumbed to infective diseases than it is in the case of healthy bodies. He states that the typhoid bacilli may retain their vitality in the decomposing spleen for three months, and are only completely annihilated by rapid putrefaction and the presence of a large number of the bacteria of putrefaction. Typhoid bacilli may retain their vitality for a period of five months in the soil, but if the earth is thoroughly saturated with rain-water they are destroyed in from seven to fourteen days. The part played by the soil in the origin of epidemics should not, he thinks, be underestimated, since typhoid bacilli can only exist in water a comparatively short time.

Luigi Manfredi, $^{2}_{\text{Oct.31}}$ as the result of an elaborate investigation of the composition of the dust of the streets of Naples, found that the number of microbes of all kinds amounted on the average to 761,521,000 per gramme (15½ grains). Remarkable differences in the proportion of micro-organisms were, however, observed in the dust from different quarters of the city. Where the hygienic conditions were most satisfactory, and there was the least traffic, the average number of microbes in the dust were only 10,000,000 per gramme (15½ grains). In some of the dirtiest streets the number was raised to 5,000,000,000 per gramme (15½ grains). In this "endless ocean" of infinitesimal life there was a large number of pathogenic organisms, and the unhealthiness of the street or quarter was directly proportional to the number of microbes in the dust.

WATER.

In a popular article on water-supply and its development for small cities in the West, Wynkoop Kiersted $^{150}_{\text{Mar.21}}$ states that rain-water stored in cisterns is often erroneously considered as the purest and best water, whereas it may be contaminated. The rain as it descends may absorb the atmospheric impurities, namely, soluble gases and fine dust, emanating from animal and vegetable life, from the decay of organic substances, and from the disintegration of mineral matter and from fuel combustion, all of which are as native to the air as sediment is to a flowing river. Moreover, the water may be contaminated by contact with painted and dirty roofs, and within the cisterns the conditions are unfavorable for the circulation of both air and water, and gases arising from the inclosures are readily absorbed. Open wells, as is well known, draw toward themselves the ground-water from considerable distances, and when in the vicinity of cess-pools become a receptacle for their subsurface drainings. The water may be simply filtered and be perfectly clear, but most dangerously foul with matter in solution. Even drive-wells with an iron incasing tube are not exempt from dangers of pollution. Of the surface supplies of water the best comes from some one of the great rivers, whose waters, by flowing over and through uneven beds of silicious sand and gravel of considerable slope, and being brought continually in contact with the air, are freed from organic matter by oxidation. The retained impurities are chiefly sediment in suspension, which are readily disposed of by settlement in basins or by filtration. "As a rule, the best location for a water-supply is in the main drainage valley, or in one tributary to it above the town site; for there the danger from underground pollution is diminished and the expense of interception the least." To the objection that such a location of the water-supply near a stream may cause its tainting by an occasional foulness in the stream, he states that such objection, though plausible, may frequently be rejected, because filter-galleries, even when located close to the river and below the low-water line, receive a greater part of their water from the land side. Though the water in such a gallery, or system of wells, fluctuates with a rise in the adjoining body of water, this does not prove an inland flow; for this rise dams the approaching water in the soil, causing it to rise therein to accommodate itself to the new conditions,—as, for example, the water in wells sunk in the sands closely bordering the ocean has been found to fluctuate with the tide while maintaining its freshness; and in a very cold climate the range of the temperature in the water collected in an uncovered gallery has been noticed to be very small compared with that in a river bordering the gallery.

Stephen E. Babcock$^{150}_{\text{Dec. 6, '90}}$ gives the following as the order of desirability of different classes of water-works, the last four, however, not being properly termed water-works, but simply means for fire protection: "(1) gravity-works, with at least eighty feet head; (2) pumping-works, with reservoir; (3) pumping-works, with stand-pipe; (4) pumping direct into main; (5) steam fire-engines, with large main on the principal street, kept filled from adjacent stream or river, with suitable hydrants; (6) steam fire-engine, with cisterns; (7) steam fire-engine, depending on wells; (8) hand fire-engine, depending on wells and cisterns." The cost of water-works for small villages and towns, including sewerage, is relatively much less than in large cities or manufacturing towns. Villages of 2000 people or under require an available supply of 200,000 gallons *per diem* or less, while a manufacturing town or city may require 200,000,000 gallons. New York City requires 250,000,000 gallons. "Taking statistics of the actual cost of plants for villages of 2000 inhabitants or under, the average cost is, approximately, $5000 to $6000 per mile of pipe laid, while a separate system of sewerage for the same town, if laid at the same time the water-works are put in, will vary from $2000 to $3000 per mile."

An editorial on "The Alternative Sources of London Water-Supply" ${}^{2}_{\text{Mar.7}}$, states that: "The eight London water companies at present supply a population of about 5,582,000, which is daily increasing, furnishing between them some 167,000,000 gallons *per diem*," and that the population of London is yearly increasing by an addition of 75,000 persons. "If all this is to be drawn from the chalk, in addition to the other millions of gallons which are needed to supply the daily wants of the country population in the district concerned, how long will it be before failing streams and parched vegetation begin still further to diminish a rain-fall and percolation which is even now inadequate to the present demands?" . . . According to Hopkinson, "If all pumping from the underground reservoir were stopped to-day, 'it would be forty years before the rain-fall (assuming a percolation of six inches *per annum*) brought up the water-level to the height it was sixty years ago.'" "If London needs a fresh supply of pure water it has a right to obtain it on fair terms, and is rich and powerful enough to do so without thereby inflicting cruel and irreparable injury on the neighbors at its gates. If Manchester can supply itself from the Thirlmere, Liverpool from the Vyrnwy, and Glasgow from Loch Katrine, need London dream in vain of getting a supply for domestic purposes from Wales,—from Bala Lake, as has been suggested, for example,—a district not densely populated, and where the rain-fall averages fifty inches *per annum*, with probably a percolation five times as great as that which obtains in the chalk district which we have hitherto been considering?"

In an article on "The Relation of Ground-Water to the Health of the Community," George E. Waring, Jr., ${}^{159}_{\text{Dec.27,'90}}$ states: "While we have yet a vast deal to learn as to the sanitary bearings of ground-water, and especially as to the relations of the rise and fall of this water to the production or fostering of certain epidemics, we have learned enough to know that, either in this water or in the ground's breathing-space between the surface of the water and the open air, we have to look for some of the most serious dangers that beset us; and that the whole question of sanitary drainage, the purification of sewage, and the lessening of malaria must here seek its most important solution. . . . Whether or not all or most of the disease-producing microbes can escape from the soil into the air under natural conditions, it seems clear that at least the causative microbe of malarial fever does so. The probability is, that most of the pathogenic microbes in the soil are conveyed to their field of operation in drinking-water,—sometimes by a flow of polluted ground-water into wells, and sometimes by its flow into small streams from which drinking-water is obtained. . . . . Polluted water in the ground is always liable to produce disease among those living over that ground, whether breathing its exhalations as drawn into cellars, when the surface is frozen, and the breathing-space of the soil becomes a source of the draft of chimneys, or drinking-water drawn from the subterranean supply.

" It makes a very great difference whether the organic matter by which the soil and the ground-water may be contaminated is introduced into the soil at or near the surface or at considerable depth. A discussion as to what takes place in the decomposition of organic matter under different circumstances is rather delicate ground, but the following may be accepted either as being correct or as indicating results which are produced by some other process than the one indicated. This theory is, that the putrefaction of organic matter and the nitrification of the products of putrefaction are due to specific organisms, which have the power to destroy not only the organic matter itself, but also those specific microbes which produce infection ; also that these putrefying and nitrifying organisms can grow and multiply only with a sufficiently free access of air. Searches made for them at various depths seem to have established the fact that, while in ordinary soil they are excessively abundant within a few inches of the surface, they are excessively rare at a depth of two feet, and that they disappear entirely at a slightly greater depth. It is probable, however, that they are capable of descending as far as their pabulum can be carried by direct progression from the surface, provided a sufficient supply of air can reach the same depth ; so that, if we thoroughly underdrain a piece of porous ground and dose it heavily with sewage, the water descending through the soil will deposit its impurities to a greater and greater depth, and that as the condition of saturation ceases, after the temporary application, air from the surface will take the place of the water and establish colonies of microbes at increasing depths. . . . This theory, that scavenger bacteria are active only in the upper layers of the soil answers the question so often asked: 'Why, if filth can safely be delivered into pipes lying a few inches under the surface, may it not as safely be delivered into cess-pools or filtering-wells reaching into the lower stream of the soil?' Filth delivered at or near the surface is immediately subjected to the action of the scavenger bacteria, and is destroyed by putrefaction and nitrification, as are its infective microbes; while that delivered at a depth where sufficient air is not present is subjected to a decomposition of another and possibly dangerous character, the multiplication of its infective microbes being favored in part, perhaps, by the character of this decomposition and in part by the absence of the scavenger bacteria."

T. W. Abbott, of Massachusetts,[79, Mar.] makes the following statement, showing the relation of the water-supply to the prevalence of typhoid fever in the cities of Lowell and Lawrence, Mass.:—

"During the four years ending with 1889, the cities of Lowell and Lawrence have had a constantly high death-rate from typhoid fever, amounting to 10.3 per 10,000 annually of the population for Lawrence, and 9.5 per 10,000 for Lowell, as compared with a death-rate of only 4 from the same cause in Boston, and 4.5 as the average of the principal large cities of the State. The cause of this increased prevalence in Lowell and Lawrence is undoubtedly to be found in the peculiarity of their water-supply, which is taken from the Merrimac River. Upon this river and its tributaries above Lawrence and Lowell are situated the cities of Nashua, Concord, Manchester, Fitchburg, and other towns, having a total population of 230,000, a considerable part of which is connected directly with the river by means of sewers. That favorable conditions are thus presented for the propagation and transmission of the specific poison of typhoid or enteric fever, from the excreta of the sick into the river, and thence to the water-supply of Lowell, and thence to the population of that city, can scarcely admit of doubt. Nor can there be any doubt that the sewage of Lowell, carrying typhoid excreta from its own population, infects the water-supply of Lawrence, nine miles farther down the river. Eight miles below Lawrence is Haverhill, in which the mortality rate from the same cause was less than 5, but Haverhill does not take its water-supply from the river."

Thomas M. Drown[159, Mar.], refers to the experiments of the Massachusetts State Board of Health on the purification of sewage by intermittent filtration, which have been carried on at Lawrence for the past two years. The following figures give the composition of the filtered water during December, 1890, compared with the Merrimac water applied:—

	Merrimac River Water. Parts per 100,000.	Filtered Water. Parts per 100,000.
Turbidity,	Very slight.	None.
Sediment,	Very slight.	None.
Color,	0.35	0.0
Odor,	Faintly vegetable.	None.
Total solids,	4.2	3.5
Loss of ignition,	1.6	0.9
Free ammonia,	0.0015	0.0005
Albuminoid ammonia,	0.0127	0.0059
Chlorine,	0.18	0.18
Nitrogen as nitrates,	0.0124	0.0191
Nitrogen as nitrites,	None.	None.

The water is free from microscopic organisms, and the bacteria rarely exceed ten or twenty per cubic centimetre, while the water applied has generally a few hundred. During the two years that this tank has been in operation the surface has not been cleaned or disturbed in any way. The slow rate of filtration (being only about one-half an inch an hour per square foot of surface) is due to the considerable amount of very fine material contained in the soil and loam.

With regard to the purification of sewage-water, H. Weigmann, of Kiel, Germany,[159 Dec. 20, '90] while admitting that the purification of sewage-water by means of irrigation is the more perfect system of treatment, asserts that in certain cases some chemical process has to be employed, and that lime still holds the foremost place. "The caustic lime combining with the carbonic-acid gas, a product of decomposition always present in sewage-water, yields a bulky precipitate of calcic carbonate, which mechanically entangles the suspended impurities and effects a rapid clarification."

HOUSE-DRAINAGE AND SEWERAGE.

The Back-Venting of Traps.—George E. Waring, Jr.,[160 Jan. 17] asserts that, "Aside from the inefficiency of back-venting as a preventive of siphonage, it has the very serious objection that it brings a current of air into close proximity to the trap, tending to lessen the sealing-water by evaporation. This is a serious and constant danger. It may, indeed, be believed that the existing back-venting of traps, carried out under the plumbing regulations of different towns in this country, result much more often in emptying traps by evaporation than it does in preventing siphonage by furnishing air to the suction. . . . The back-venting regulations would never have attained their wide influence and popularity had they not opened a field for a great increase of work and profit for the plumber. . . . All ordinances and regulations requiring the back-venting of traps by special pipes communicating with the air above the roof, or with the upper part of the soil-pipe, should be abrogated, and that some reliable trap, that will hold a sufficient water-seal in spite of any amount or continuance of suction that can be produced in house-drainage, should be required to be used in all positions where there is a liability to siphonage."

Andrew Young$^{159}_{\text{Apr.4}}$ cites the experiments made by Glenn Brown, of Washington, D. C., as a reply to Putnam's communication on "The Trap-Vent Law."$^{159}_{\text{Mar.28}}$ He concludes with a statement that the experiments in trap-siphonage proved that a simple S-trap, properly vented, was safe from failure by trap-siphonage and back-pressure, while all traps unvented were liable to fail from either back-pressure or siphonage. From the experiments made, he concludes that the S-trap, properly ventilated, is the best form to use, and that no trap should be used without ventilation.

Application of Sewage to Land.—Henry J. Barnes$^{99}_{\text{Mar.6}}$ gives a review of the methods of sewage disposal in various European cities, as follows:—

Glasgow discharges its sewage into the tidal water of the Clyde, and Russell, the officer of health, declared soil treatment to be the only means by which the sewage of Glasgow could be disposed of without objectionable features. In Edinburgh the sewage is disposed on a part of the 450 acres belonging to Christie Miller. All the land is under-drained, and Littlejohn and Archer, health officers, express the opinion that soil treatment was the most satisfactory of all methods known for disposal of sewage. Liverpool discharges sewage in the tidal estuary of the river Mersy. Hope, the only health authority met in Europe who spoke favorably of this method of disposal, declared the system to be satisfactory. At Manchester and Salford the river Erwell, which separates these large cities, receives the sewage of both. It rivals the Clyde in its offensive condition. Birmingham has a sewage-farm, where the sewage of 650,000 people, amounting to 17,000,000 gallons per day, is purified and utilized on 1260 acres. Leamington possesses a sewage-farm, which Wilson, the health officer, asserted to be conducted in a profitable and unobjectionable manner. Croyden, a city of 94,000 inhabitants, has a farm of 500 acres, without under-drains, for the purification of sewage. London discharges its crude sewage at the tidal estuary of the Thames. Five millions of dollars, in addition to twenty-one millions already expended, is now being employed in constructing a plant to treat the sewage with lime, sulphate of iron, and permanganate of potash. The health officer of London, Therley Murphy, states: "The city will never have a satisfactory system until land is employed for purifying the sewage." Paris has irrigation fields at Gennevilliers, where the sanitary and financial results are entirely satisfactory. In Berlin not a privy-vault or cess-pool is permitted within the city limits. With regard to the sewage-farms, Hobercht, the city engineer, states that "the system fulfills all requirements from a sanitary point of view, and nets the city from $\frac{2}{3}$ to $2\frac{1}{2}$ per cent. above the cost of operating, after deducting interest on cost of land in use." With regard to the opinion that profitable utilization is doubtful, and the possible want of safety in employing the human excreta in sewage as a fertilizer, and that, therefore, a discharge into a water-course or tidal basin, if available, is the cheapest and best way to get rid of it, the writer states that, with the exception of Pasteur and Hope, of Liverpool, he knows of no English, French, or German authority holding this opinion.

In a discussion of the above paper in the Massachusetts Medical Society, Suffolk District, $\overset{89}{\text{Mar.5}}$ Eliot Clarke referred to the very valuable report of the Royal Commission on Metropolitan Sewage Discharge, which had obtained and sifted about all the trustworthy evidence to be had concerning sewage disposal, and quoted its conclusion with regard to the profit to be expected from sewage farming, which, in substance, is as follows:—

"In some very favorable cases a profit may be made without purification, and very frequently purification may be effected without profit; but, apparently, the two cannot be combined." At Gennevilliers, Clarke stated that the sewage is only turned upon the land when it is wanted. During rainy seasons, when more water would hurt the crops, it is turned into the Seine.

Utilization of Sewage.—The Board of Hoghton-le-Spring has decided[159 Oct. 11] to adopt a system of sewage utilization recommended by D. Balfour. "The process consists in first mixing the sewage in large tanks (in duplicate) with alumino-ferric, a cheap chemical, which contains 46.7 per cent. of sulphite of alumina, which is suspended in iron baskets or cages, immersed in the sewage, to admit of the necessary proportions being dissolved to effect precipitation. It does not, like a large number of chemicals, require any machinery or add any bulk to the sludge, being entirely soluble in water. It exercises a deodorizing effect, and is not liable, being a neutral salt, to refermentation. The clarified sewage is then passed on to ten acres of loam land laid out for intermittent filtration, which consists in forming the land into half-acre beds, broad-ridged, and furrowed and hoed in regular rotation, and having special under-drainage, with ventilation shafts from which, with regular and systematic management, the effluent will pass in a colorless and inodorous state. As sufficient suitable land could not be obtained, this chemical-precipitation process was conjoined with the available limited land for the purpose of chemically precipitating and deodorizing the solid matter as much as possible before applying the sewage to the land. Various succulent crops, including vegetables and osiers, are grown on the ridges, the sewage filling the furrows. The scheme was approved by the Local Government Board, and the contract for carrying it out has been let by the Local Board of Health to John Carrick, contractor, Durham, under the superintendence of the engineer."

Sewerage precipitation, as practiced at Richmond, England,[159 Oct. 8] the works having been put in operation during the present year, is described as follows:—

"The works provide each of the parishes of Barnes, Kew, and Petersham with an outlet into which it can discharge its sewage-matter, the outlets being placed at a sufficiently low level to drain the whole district. In like manner Richmond and Mortlake have been provided with several such outlets for the reception of their sewerage, and for diverting its flow from the river Thames. These outlets for the five parishes are connected together by main intercepting sewers, which have been constructed by the Main Sewerage Board. These sewers vary in size from 12 inches up to 40 inches in diameter. The sewers all have self-cleansing gradients, varying from 1 in 250 for the smallest sewer to 1 in 1200 for the largest. Flushing is provided for, where required, by the admission of Thames river-water at the point where the sewers begin, and by pen-stocks placed in the sewers. The sewage will flow by gravitation to the spot situated on the edge of the river Thames, in the parish of Mortlake, where the invert of the outfall sewer and pump-chamber is 25 feet below ordnance datum. The topographical maps in England are all compiled by the ordnance office, and 'ordnance datum' is thus the point from which elevations and depressions are measured. The site obtained for the pumping station and disposal works comprises 11 acres, of which about 7 acres only are yet brought into use. When the sewage reaches the works through the last length of the sewer, it passes through a strainer made of iron rods into the pump-chamber. In this chamber are 3 sets of single-acting plunger pumps designed for lifts of 43 feet. Each set of pumps with its engine is capable of raising about 4,000,000 gallons of sewage in a day, the 3 together being therefore capable of dealing with 12,000,000 gallons per day. When the sewage rises to a certain height in the sewers and pump-chamber, the fact is communicated by an automatic arrangement of electric bells. The strained sewage flows continuously into the pump-chamber, where it receives a small dose of milk of lime from the vats in one of the chemical-mixing rooms. It is then pumped to the surface, the operation of pumping also serving to thoroughly mix the sewage and the milk of lime together. The partially treated sewage then flows from the delivery pipes of the pumps by a covered channel into the inlet-channel for treated sewage. At the head of the channel is a close iron-bar strainer, which removes any large matter that may have passed the first strainer. On its way to the channel the sewage passes through the second chemical-mixing room, where it receives a dose of a solution of sulphate of alumina, carbon, and iron, and is thoroughly mixed therewith by an agitator. The channel is then carried upon arches to the tanks. The precipitation tanks are 11 in number, with an aggregate capacity of 1,210,000 gallons. The treated sewage is admitted continuously into one or more of the precipitation tanks as required. As the tanks fill precipitation takes place, the precipitates falling rapidly to the bottom, while the effluent water, now deprived of the whole of its polluting matter in suspension and nearly all of that in solution, flows continuously over weirs at the other end of the tanks. This effluent water is sufficiently pure to be discharged direct into the river, and can be passed thereto by an outlet at one corner of the works. The effluent water is, however, raised to a higher degree of purity, whenever required, by filtration through filter-beds, constructed of layers of various-sized gravel, sand, and carbon, the surfaces being covered with a thin layer of agricultural earth sown with grass. The precipitation tanks are emptied of their entire contents once a day, and when a tank has to be emptied it is shut off from the inlet-channel for treated sewage by valves, and allowed a short time for repose. The water is then drawn off from the tank by a floating pipe, the upper portion of the water being discharged onto the high-level filter-beds and the lower portion onto the low-level filter-beds. The discharge from both filter-beds will flow into the Thames by gravity. The precipitate commonly called 'sludge,' at the bottom of the tank, averages from 2 to 3 inches deep, being nearly all, or 90 per cent., water. The sludge having thus been deprived of some of its water and brought into a favorable condition for pressing, is lifted by pumps into iron receivers placed in the press-house. These receivers each contain a charge for one press. In these lime—that is, a certain quantity of lime—is added to it, so as to facilitate the operation of pressing, and it is forced by rams into the presses. The water pressed out of it, again a comparatively small quantity passes to the pump-chamber and mixes with the sewage, to be treated over again, and the solid sludge-cakes, measuring 3 feet square by 7½ inches in thickness, are removed from the presses. Sludge in its pressed condition occasions no nuisance whatever, and may be stacked and stored without creating any annoyance. For agricultural purposes it has a manurial value rather higher than that of the best farm-yard manure."

The city of Marseilles, France, which at the present time has practically no drainage at all,[22 Oct. 14] and whose death-rate has reached the alarming rate of 32 per 1000, has adopted a new drainage system, which, it is stated, will be carried out in a most thorough manner. Sewers are to be laid down through the length and breadth of the city, the total length of pipes required being one hundred and twelve miles, and the outfall to be some distance out at sea. Rigid regulations are to be imposed on house-owners. obliging them to connect their premises with the main drain.

ALIMENTATION.

Tuberculous Meat.—An editorial$^{2}_{\text{Feb.2}}$ calls attention to 2 cases recently brought before the magistrates of Portsmouth and Birkenhead, respectively. In the first case there was tuberculosis of the pleura, and tubercle was also found in the flesh itself, as confirmed by the microscope. The lungs had been cut up into small pieces and buried by the butchers. A fine was inflicted in this case; but in the Birkenhead case, while the lungs were affected, no examination of the glands had been made.

The editorial says:—

"It is possible that glands other than those at the roots of the lungs might be perfectly healthy, and, although the use of any flesh from an animal in which there was this tuberculous condition is distinctly objectionable, there has not yet been accumulated sufficient reliable evidence to enable any one to maintain that a localized patch of tuberculosis in the lungs, with no affection of the neighboring glands, would be sufficient to render the flesh of an animal unfit for human food, especially if it were well cooked. The very fact that it is thought necessary to appoint a royal commission to consider this question leaves it open to butchers to say that it is still unsettled. Until an expression of opinion is obtained from the royal commission, the present uncertainty as regards convictions for tuberculous meat must necessarily continue."

Referring to the arrest and fine of the tenant of a slaughter-house at Newcastle-on-Tyne, for having in his possession 2 emaciated, tuberculous cows, another editorial$^{2}_{\text{Oct.17}}$ calls attention to the fact that there must be heavy gains in this disgraceful trade to induce men to run the risk of such fines, but pertinently states that the difficulty is to know what to do when the disease is in an earlier stage and localized. The query is put, "At what point does the chance of infection become so small that it may be disregarded, or at what stage of bovine tuberculosis should the increasing danger to human life begin to outweigh the (diminishing) cost of condemning the carcass?" There should be some accepted standard, and, the greater the difficulty in formulating such a standard, the greater is the necessity for settling it once for all, instead of leaving it to be fought out time after time in court.

The Necessity of Meat Inspection is also the subject of an editorial,$^{9}_{\text{Nov. 7}}$ which sets forth the necessity of animals being examined immediately before being slaughtered, and again before the meat is exposed for sale. In Berlin all fresh meat, not slaughtered in the public abattoir, is subjected to official inspection before its sale is permitted. A staff of one hundred and sixteen inspectors, supplemented on two days in the week by forty or fifty meat-inspectors and veterinary surgeons, is distributed at various inspection stations, where the meat must be brought for examination, both macroscopical and microscopical, and, after such examination, stamped according to its condition. An examination of the results of one year's inspection shows that much of the meat rejected contained tubercle. Trichinæ and measles were present in pork eighteen and seventy-eight times, respectively, while in more than 1000 calves the meat was too watery to be fit for food. Echinococci and thread-worms were found in some of the meat, and much that was brought to the stations was rejected because it had become decomposed. A thorough system, like that now in operation in Berlin, is what is needed in every American city, The University of Pennsylvania has inaugurated a course of instruction intended to prepare students for this special branch of investigation.

Tuberculous Milk.—Bang$^{886}_{\text{No.4}}$;$^{106}_{\text{Apr.}}$ concludes, from a number of experiments, that the danger of using milk from tuberculous cows which have healthy udders is not so great as some would have us believe. Most of his experiments gave negative results; but, on the other hand, milk, and also butter, from cows with tuberculosis of the udder, proved itself highly infectious when fed to the animals. Heating infected milk to 80° C. (176° F.) does not always kill the bacilli; a temperature of 85° C. (185° F.) is necessary, although heating to 75° C. (167° F.) is sufficient to render the milk innocuous when it is simply fed to the animals and not injected under the skin. After feeding on raw milk containing tubercle bacilli, the animal, at the end of seventeen days, showed tuberculous nodules in the glands about the pharynx, from which Bang concludes that the scrofulous glands of children may, in many cases, result from infection through the food. Milk from 8 women with advanced phthisis proved to be non-infectious for rabbits.

In discussing the relation of milk to septic disease, and particularly the question as to whether the age of the patients attacked during a given epidemic may be regarded as a test as to whether the epidemic is due to infected milk or to other causes, Atkinson,[6, Jan.3] says: "If by far the larger proportion of individuals attacked be children, it would be only natural to suppose that the milk was in some way or other the cause, inasmuch as children are by far the larger milk-drinkers. If, on the other hand, grown-up people furnish the larger number of victims, it is not unlikely that defective drainage is the cause."

A writer,[6, Jan.10] commenting on this suggestion, states that the specific diseases with which milk is best known to have causal relation are scarlet fever, diphtheria, and enteric fever. The two former are essentially diseases of childhood; the latter is more especially a disease of young adults. Acting on the rule laid down, diphtheria and scarlet-fever occurrences would, as such, raise suspicion of milk infection, whilst occurrences of enteric fever would have just the opposite effect. As a matter of practice, it is well known amongst investigators of infectious diseases that persons who use nothing but cooked milk do very largely escape from attacks of the three diseases named during epidemics in which members of the same households who use uncooked milk are specially attacked by them.

A New Poison in Cheese.—Victor C. Vaughan[159, Jan.24] reports that at the Hygienic Laboratory of Michigan University, in certain samples of cheese submitted, "the poisonous character of the cheese has been proven by experiments upon animals, but we have failed to demonstrate the nature of the poison. Tyrotoxicon could not be detected."

"One sample of this class was found by Novy to be very poisonous. Some of this cheese was covered with absolute alcohol, and after standing in a dish for some weeks the alcohol was allowed to evaporate; then 100 grammes (3½ ounces) of the cheese was fed to a young dog, and caused its death within a few hours. Sterilized milk, to which a small bit of the cheese was added, after standing in the incubator at 35° C. (95° F.) for twenty-four hours, became so poisonous that 100 cubic centimetres (3⅜ ounces) of it introduced into the stomach of a full-grown cat caused death. Novy made plate cultures from the cheese and from the spleen and liver of the dead animals, and succeeded in identifying one germ as common to both. Sterilized milk inoculated with a pure culture of this germ, and kept in the incubator, proved fatal to cats. But with the advent of cold weather the germ lost its toxicogenic properties, which were not restored by subsequent cultivation in the incubator. In a second class of samples the poisonous character of the cheese was not confirmed by direct feeding. Cats, rats, and dogs were fed the same quantities as above, without any appreciable effect.

"Two kilogrammes (5 pounds) of a cheese of this class were extracted repeatedly with absolute alcohol. The part insoluble in alcohol was then extracted within water. The aqueous extract, after filtration, was allowed to fall slowly into three times its volume of absolute alcohol. A voluminous, flocculent precipitate resulted. After twenty-four hours the supernatant fluid was decanted, and the precipitate was dissolved in water and re-precipitated with absolute alcohol; then it was collected and speedily dried on porous plates. A small bit of this precipitate was dissolved in water; and 40 drops of this solution, injected under the skin on the back of cats, produced invariably within one hour vomiting and purging. After the partial collapse which followed the vomiting and purging, and which was evidenced by the animal sitting with its chin resting on the floor, recovery gradually followed. The same amount of the solution injected into the abdominal cavity of white rats rendered the animals, within ten or fifteen minutes, perfectly limp, and the only evidence of life observed was rapid respiratory movements. The rats lay upon their sides, and could be handled without manifesting any attempt at movement. In this condition some died after three or four hours, while others, after lying in this position for from eighteen to twenty-four hours, gradually improved, and after some days seemed to be wholly recovered That animals were not affected when fed with the whole cheese may be explained by the supposition that they did not in this manner get enough of the poison to affect them. Four samples of this cheese have been tested for the poisonous albumen, with positive results. It may be found that traces of this poison exist in all samples of green cheese. This point will be investigated. It is highly probable that the poisonous effects of some samples of sausage and meat are due to similar products of bacterial activity."

Mushrooms as Food.—The alarming symptoms$^{6}_{\text{May 30}}$ which occasionally follow the use of fungi when taken as food are familiar to most of our readers. The risk in this particular, however, is less than it might be. In actual market custom we recognize but a very few forms of edible fungi, though it must be allowed that even in these we are liable to deception of a somewhat dangerous kind. It is, therefore, a matter of some importance that the public mind should be informed as far as possible of the qualities which distinguish the edible from the poisonous varieties. To give a precise definition, which would also be comprehensive, is, however, no simple matter, and as a matter of fact the number of edible fungi, even in this country, is much greater than is commonly understood. It may be said, however, that a high color, a scaly or spotted surface, and tough or watery flesh are usually associated with poisonous properties, while the edible species are but seldom highly colored, scaly, or spotted, but usually white or brownish, and brittle on fracture. The former, moreover, grow clustered on wet or shady ground, the latter singly in dry pastures. The common British mushroom is known by its pink hymenium or gills. Fungi which have a bitter or styptic taste, or which burn the fauces, as well as those which yield a pungent milk, those of livid color, and those which on being bruised assume various hues, ought to be avoided. It should be remembered, also, that all plants of this class readily undergo decomposition, and should therefore be eaten as fresh as possible.

Food Preservation and Adulteration.—The question as to whether the addition of preservative agents to foods constitutes adulteration within the meaning of the act was discussed in two interesting papers read at a recent meeting of the Society of Public Analysts.$^{6}_{\text{Jan. 10}}$ An editorial on this subject states that a milk-seller was summoned before a magistrate for selling milk partly deprived of its cream, and which contained boracic acid, described in the summons as a poisonous ingredient. Conviction was obtained on the evidence of the abstraction of 30 per cent. of the original fat, although the bench reprimanded the defendant concerning the addition of boracic acid. The editorial also states that, from the fact that not only milk, but other foods, as butter, cream, fish, meat, and meat preparations prepared for the exclusive use of the invalid, are frequently preserved by the addition of boracic acid or borax, this question becomes one of considerable importance.

" The addition of other antiseptics to various articles of diet is also well known. Such are, for example, salicylic acid, sulphurous acid, bisulphites, and benzoic acid or benzoates, which, according to Hehner, are gradually taking the place of salicylic acid. In analyses of food, too, made from time to time by the *Lancet*, attention has been directed more than once to the presence of salicylic acid, boracic acid, and borax in milk, as well as in many prepared foods. From investigations which have been made, it is found that 1 gramme (15½ grains) of boracic acid per litre (1 quart) of milk retards the coagulation—when the temperature throughout is 15° C. (59° F.)—for from twenty-four to thirty-six hours; 0.5 gramme (7¾ grains) for only twenty-one hours; whilst at 35° C. (95° F.) this quantity is without effect, and 1 gramme (15½ grains) retards the coagulation under these conditions for ten hours. It would be necessary, then, to employ not less than 1 gramme (15½ grains) of the acid per litre (1 quart) of milk. Hehner finds that in the case of butter a mixture of boracic acid and borax is mostly used. One sample contained, for example, 0.41 per cent. boracic acid and 0.55 per cent. borax. Stress is laid upon the fact that in almost every country in the world, with the exception of England, which was the first to frame food laws, this question has been taken up and the use of antiseptics in food prohibited. France was the pioneer in this direction. The beer imported into that country from Germany was found to contain, almost invariably, salicylic acid, and the French brewers in their own interests, of course, started action. The Paris Court of Appeal decided that salicylic acid was to be regarded as an adulterant, and to the prejudice of the purchaser,—a decision which was based on the report of a Commission of the Académie de Médecine of Paris, appointed to inquire into the action of salicylic acid in food. The Commission reported that the use of this antiseptic in food had, in many instances, been known to produce serious effects, and that small but continued doses were likely to result in grave gastric and hepatic disturbances. In 1888 all addition of salicylic acid to food was prohibited by the Dutch government, and the Italian government, in 1887, forbade its addition to wine, and regarded it as an adulteration. The Spanish government prohibited the use of antiseptics in wine, and the Austrians also regarded salicylic acid in the light of an adulterant. This general prohibition of the use of salicylic acid, in particular, gave rise to the employment of other substances. In France benzoates were chiefly used, and in Germany sulphites and borates. There appears to be little known about the action of boracic acid and borates on the human economy. It has generally been considered the mildest and most harmless of antiseptics. The properties of salicylic acid and its sodium salt are, of course, better known. It has been quite recently shown that salicylic acid, according as it was natural or artificial, exhibited different properties, and attention has been called to the fact that injurious physiological action has followed the use of the artificial variety, which commonly contains creasotic acid, and to this substance the injurious effects were attributed. There can be no doubt that the presence of an antiseptic in food would prove injurious to many persons; but, on the other hand, few object to the addition of a minute amount of preservative to cream, butter, and milk, for instance, which are, especially in hot weather, so liable to become unpleasant and objectionable by reason of putrefactive changes. The question is an important one, and calls for immediate investigation."

The "Re-Greening of Vegetables" with Sulphate of Copper.—The Health Committee of Glasgow $^{2}_{\text{Jan. 8}}$ have decided to intimate to dealers in canned vegetables that the sanitary officials will institute proceedings whenever the circumstances in connection with the re-greening are sufficient to warrant a prosecution. "Nine-tenths at least of the green preserved vegetables sold in France or abroad are re-greened with sulphate of copper, according to Gautier; and the process consists in plunging fresh vegetables from five to fifteen minutes in a boiling solution of sulphate of copper, of strength varying according to the nature of the vegetable, but still more according to the practice of the individual manufacturer.

"According to a French commission, reporting in 1881, from 8 to 27 parts of copper salt per 100,000 of dried vegetables were found as the results of analysis. In 1853 this practice was prohibited by a police ordinance applicable to Paris only, but in 1860 the French Consulting Committee of Public Health advised its extension to the whole country, which was carried out. . . . On April 18, 1889, when the Consulting Committee of Hygiene of France adopted a report by M. Grimaux, and declared, 'in the position of our information as to the noxious influence of salts of copper, there is no ground for prohibiting the present practice of re-greening with salts of copper.' Three days afterward the prohibition was withdrawn. . . . . The report of M. Grimaux, while sanctioning the free manufacture of preserved vegetables, expresses the opinion that the consumer ought to have the power to select the food which he purchases, and that it will, therefore, be necessary 'that un-greened vegetables should be marked *légumes au naturel* and that re-greened vegetables should be distinguished as *petits pois ou haricots à l'Anglaise*, a designation under which they are known to the trade.' This is very nearly on a level with a previous suggestion that re-greening for export should be permitted, but *not for home use*. . . . . Seeing that the French government have annulled their prohibition in the interests of the manufacturers, it remains for the consumers to take care of themselves; and that is what the Glasgow consumers, through their Health Committee, have decided to do."

Food- and Air- Passages in Relation to Infection.—Miller, of Berlin, $^{2}_{\text{Aug. 16}}$ enumerates the local and general diseases traced to the action of bacteria in the mouth, as follows: (1) caries of teeth; (2) diseases of dental pulp; (3) diseases of the pericementum; (4) alveolar abscess (cases were related with fatal termination); (5) osteitis, osteomyelitis, periostitis, necrosis (the frequency of cases terminating fatally was mentioned); (6) dental fistulæ; (7) septicæmia of dental origin; (8) pyæmia of dental origin; (9) meningitis of dental origin; (10) complications produced by impeded eruption of wisdom-teeth; (11) pyorrhœa alveolaris; (12) disturbances of the alimentary tract; (13) diseases of the lungs,—(*a*) croupous pneumonia, (*b*) gangrene; (14) chronic swelling of the lymphatic glands; (15) the infectious anginæ; (16) angina Ludovici; (17) diseases of the maxillary sinus; (18) pneumococcus abscesses; (19) disturbances through resorption of products of putrefaction from the mouth; (20) stomatitis ulcerosa, scorbutica, etc.; (21) actinomycosis; (22) noma; (23–29) pharyngomycosis, stomatomycosis, thrush, stomacace, aphthæ, herpes, labialis, parotitis; (30) diphtheritis; (31) tuberculosis; (32) syphilis; (33)

infections following operations in mouth; (34) infections through wounds with dental instruments.

Henry Sewill $^{2}_{\text{Aug. 18}}$ states that the active agents in caries of the teeth were acids and micro-organisms. The great bulk of acid was the product of fermentation of the organic matter commonly present in the mouth and lodged around the teeth. These acids were often assisted in their action by acid secretions. Fermentation being due to action of micro-organisms, bacteria must be considered a prime factor in the causation of caries, the rapidity of progress of which was mainly governed by the inherent qualities of the tissues.

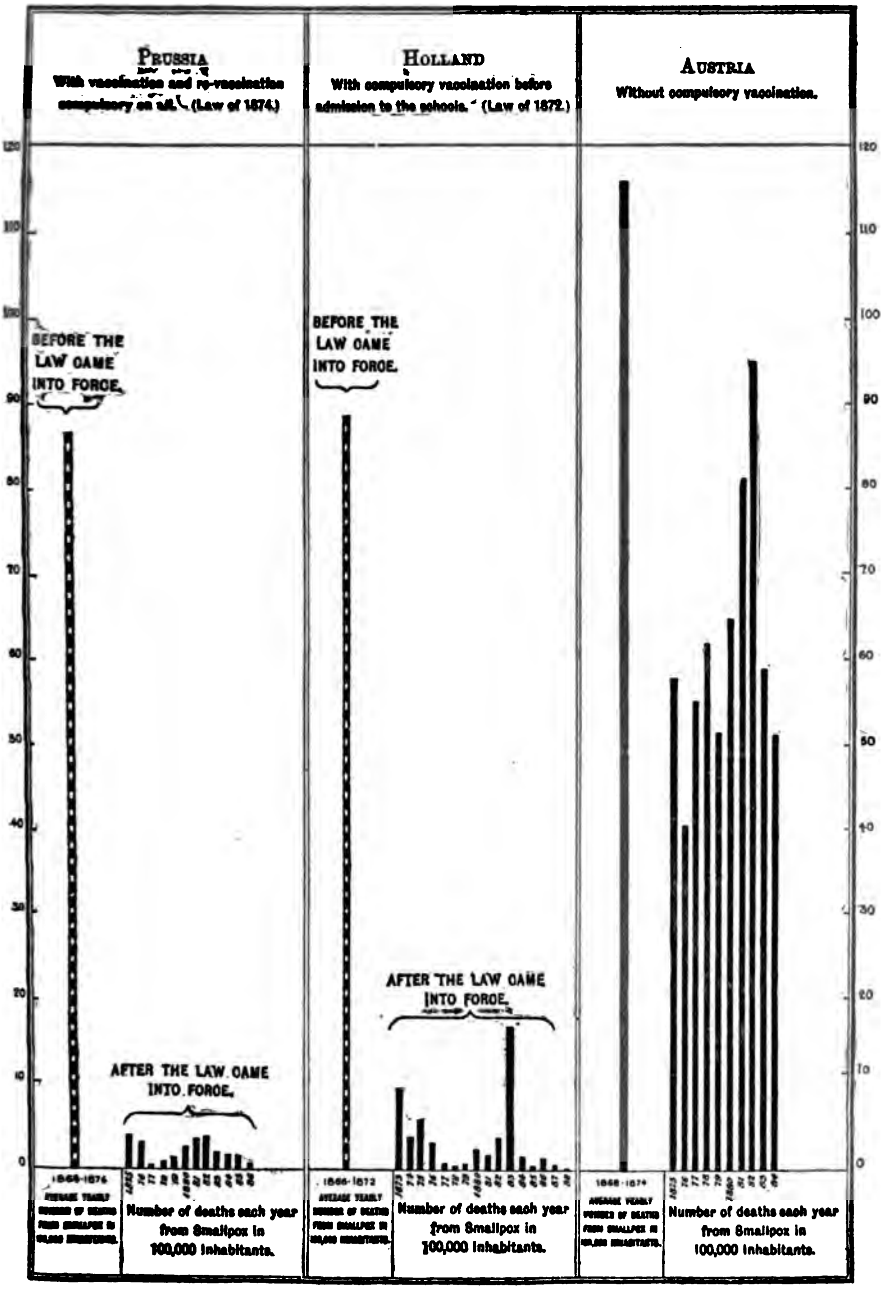
VACCINATION.

The matter of compulsory vaccination has been the subject of a number of papers and discussions—both foreign and domestic—throughout the year. At a meeting of the Académie de Médecine, Paris, Hervieux $^{22}_{\text{Jan. 21}}$ read a paper on "Vaccination and the Resistance Met with Against it in Certain Classes of the French Population," and in conclusion proposed that a law be passed to render it obligatory. This proposition aroused the opposition of Le Fort, who discussed the results of obligatory vaccination in England and Prussia, and endeavored to prove that the decrease in the mortality of small-pox in these countries arose from the vigorous measures taken to prevent contagion by isolation and the erection of special hospitals, and expressed himself as opposed to the principle that a person should be vaccinated against his will, adding that such a law would never be voted in a French Chamber.

The same subject is discussed, in a document addressed to the Second Chamber of the States-General in Holland, by leading members of the medical profession of the Netherlands. $^{15}_{\text{Dec., '90}}$ The graphic illustration accompanying the document is of special interest. (See diagram, opposite page.)

Efficient Vaccination.—Fred. A. A. Smith, $^{2}_{\text{Oct. 10, 17}}$ states that the only way to tell whether vaccination is efficient is to inoculate in two places in one arm, and, just as soon as the vesicles rise, to take some of the lymph and inoculate the other arm. The three will then mature at the same time, if efficient, thereby showing that the poison has thoroughly permeated the whole system.

John Ormsby, of Dover, states that vaccination is more cer-



(*London Practitioner.*)

tain to be efficient if done in four or five points than in one; that one normal vesicle guarantees as great protection as five; that the protective influence of vaccinia is entirely destroyed by any exhausting disease or prolonged alterative treatment, as typhoid fever, rheumatic fever, scarlet fever, diphtheria, a course of mercury, or iodide of potassium.

FEMALE HYGIENE.

In an article upon the necessity of female hygiene, by George J. Engelmann,[9 Dec. 6,'90] quotation is made from a report by the Bureau of Labor Statistics of 1875 on the special effect of certain forms of employment on the health of women. The causative errors in the management of mental or manual labor mentioned in this admirable report are as follow: "1. (*a*) Youth unequal to the work; (*b*) impairment of animal growth; (*c*) a constrained position. 2. (*a*) A disregard of ultimate injuries; (*b*) unbroken application without vacation for a long term; (*c*) depression and disease inviting demands on immature vitality. 3. Employment in unsuitable occupation for condition of body and mind. 4. (*a*) Unduly long hours; (*b*) concentration of vital energies, involving extreme nerve-tension; (*c*) unfavorable sanitary surroundings."

QUARANTINE

Quarantine was the subject of an interesting discussion at the Seventh International Congress of Hygiene and Demography,[2 Aug. 15,'91] the English opinion thereon being summarized in the following extract from the address of the President of the Section of Preventive Medicine, Sir Joseph Fayrer: "That we can exterminate zymotic disease altogether is not to be expected, but there cannot be a doubt that we may diminish its incidence, and though we may never be able to reach the *fons et origo mali*, yet we can make the soil upon which its seed is sown so inhospitable as to render it sterile."

Surgeon-General J. M. Cunningham, referring to methods of preventing the spread of epidemic disease from one country to another, said of land-quarantine that it had proved impracticable; that sea-quarantine had done no good; that quarantine was a tyranny, obstructing commerce and interfering with personal liberty. With regard to the second method, viz., medical inspection of every ship arriving in port, action being taken on the presence of illness, that this method was of great benefit to the sick, but could not be credited with preventing epidemics of cholera.

The third method was the only one for preventing the spread of epidemic disease from one country to another. It consisted in the enforcement of sanitary improvement; that is, the better drainage of towns and the better water-supply, food-supply, etc., of the people.

Rochard, of Paris, thought that some of England's resistance to quarantine should be ascribed to its great distance from the source of cholera. He submitted the measures taken at the frontier by the French authorities during the last cholera epidemic, and described the means of preventing the transmission of epidemic diseases from one country to another, as: (1) isolation; (2) disinfection; (3) sanitation; and expressed the belief that it is necessary to persevere in the employment of those measures which respond to the necessities of the moment and to our present knowledge.

Henri Monod calls attention [2 Oct. 10] to the fact that the countries in the Mediterranean basin which are the most severe in the matter of quarantine are English possessions, namely, Gibraltar, Malta, and Cyprus. Furthermore, that it was the British representatives from Canada and Australia who maintained energetically the necessity of a quarantine at the London Congress. Montizambert, of Canada, [2 Aug. 15] read a paper descriptive of the quarantine restraints imposed at Grosse Isle, twenty-nine miles below Quebec. The restraints there imposed are practically the same as those at the United States sea-ports.

The quarantine system of the United States is of a dual character, being partly local and partly national. Although a matter of some dispute, up to the present time maritime quarantine has been considered as a police function of the State; but by some it is held to be a matter for national regulation, under the provision of the Constitution empowering Congress to regulate commerce. With the exception of the eight national quarantine stations about to be mentioned, the maritime quarantines are under local management; but at the Delaware Breakwater, Del.; Cape Charles, Va.; Blackbeard Island, Ga.; Dry Tortugas, Fla.; Chandeleur Islands, in the Gulf of Mexico; San Diego and San Francisco, in California; and Port Townsend, in Washington, the United States government has established national quarantine stations, both for inspection and as stations of refuge, where infected vessels, after being intercepted at the local ports, are sent with their crews for treatment. In the Southern ports of the United States so great is the apprehension with regard to yellow fever that several cities have established complete quarantine plants, and, during the quarantine season proper, thoroughly disinfect all vessels that arrive from South American and West Indian ports, without regard to their being infected; but, should a vessel appear known to be infected, it is immediately sent to the nearest national station whose location is remote from the mainland.

Disinfection.—At the various quarantine stations of the United States the process of disinfection, besides thorough cleaning, discharge of ballast, pumping out of bilge-water, and scrubbing of wood-work, consists of: (1) fumigation with sulphur dioxide; (2) the use of solution of bichloride of mercury; (3) the use of steam heat.

Superheated steam is no longer considered necessary for thorough disinfection. It has been found[146, v.6, p.590] that all germ-life is destroyed at a temperature of steam at 100° C. (212° F.) much sooner than at any higher temperature.

"Sulphur dioxide, to be in any way efficient, must be delivered into the holds of vessels in at least a 10-per-cent. strength, in order to overcome the resistance offered by the moisture in the wood, and to insure its diffusion to all parts in sufficient strength to be germicidal to the non-spore-bearing micro-organisms."

For the disinfection of rags, the following regulations have been promulgated by the Treasury Department of the United States[2147]: (1) boiling in water not less than one hour, all rags to be unbaled for this purpose; (2) exposure to steam not less than one hour, the steam to be of a temperature not less than 100° C. (212° F.) nor greater than 115° C. (239° F.); (3) exposure not less than six hours to sulphurous-acid gas, made by burning not less than 3 pounds (1440 grammes) of roll-sulphur to each 1000 cubic feet of space; (4) exposure not less than six hours to an atmosphere containing 3 per cent. of sulphurous-acid gas liberated from its liquid state (liquid sulphur dioxide). In methods No. 2, No. 3, and No. 4 the rags must be well scattered upon racks, or so arranged that they can from time to time be turned in such a manner that all shall be exposed to the steam or gas. A. Wynter Blyth,[2, Feb. 28] in an address on "The Present Position of Disinfection," after referring to the fact that non-spore-bearing organisms were much less resistant to heat or to chemical action than the spore-bearing, pointed out the importance of temperature, time, and place as factors, and that, under appropriate conditions, such simple means as lime-washing and aëration were amply sufficient for disinfection in most cases. Recent experience has proven the remarkable efficacy of lime. Boer has shown that, while the addition of very small quantities of lime to a culture fluid favored the development of bacteria, larger quantities, or the equivalents of potash or soda, producing an alkaline reaction equal to what was known as 50 degrees of normal acidity, were speedily fatal to all pathogenic organisms in any other form than the spore. Thus, the strongly alkaline soft-soap was a far better germicide than carbolic or thymol soap, and the stripping of paper off the walls, lime-washing of walls and ceilings, with scrubbing of the floor and wood-work of a room with soft-soap, was generally sufficient for all the purposes of disinfection. Lime, from its power of absorbing sulphur compounds and other offensive gases, was specially suited for application to the contents of street-gulleys, the removal of disinterred corpses, use in mortuaries, and in nearly all circumstances in which it would not cause the evolution of ammonia. In the disinfection of rooms he believed that sulphur fumigation was a valuable adjunct to lime-washing.

E. von Esmarch $^{1023}_{\text{Mar.}};{}^{2}_{\text{Jan.17}}$ enumerates some of the points which should be specially attended to in the use of disinfecting apparatus. He agrees with most authorities that steam, either circulating or under pressure, and without the admixture of air, is by far the best means of disinfecting clothing and other articles that will withstand the action of moist heat. As to whether circulating steam or steam under pressure is best, he thinks that it is entirely a matter of convenience; but it will be readily understood that where large chambers have to be constructed it would be difficult and extremely expensive to build them of sufficient strength to withstand any great pressure from within. Even in the case of smaller sterilizing chambers, the expense of obtaining them sufficiently strong is so great that in most cases their use is precluded. The main *desiderata* for a perfect disinfecting apparatus are that it shall be close to the source of the steam-supply; that there shall be sufficient steam developed to fill it thoroughly and to keep up the temperature for some length of time; that the steam shall be sent in at the top and passed out at the bottom, in order that every crevice of the apparatus may be filled; and that, where it is used in large establishments, it shall be placed between two rooms, into one of which articles to be treated are to be taken and passed in at one door of the sterilizer, while the other room should be at the other end of the sterilizer, and into it the clothes should be passed, so that they shall not again be brought into contact with unsterilized clothing, etc.

Articles that are to be disinfected should not be allowed to remain too long in contact with steam, and, before being steamed, they should be thoroughly heated, so that there is no opportunity for the steam to condense on cold surfaces; and in the same way they should be well dried by heat after the steaming process has been concluded. Twenty minutes is quite long enough to allow most ordinary articles to remain exposed to a moist heat of 100° C. (212° F.); so that they should be left for this length of time after the temperature has once been raised to this point, this being determined by an electrical-contact thermometer or a thermometer placed in a tube through which the steam escapes; some simple manometer should be used, to determine the pressure that has been obtained by superheating the steam. The greatest attention should be paid to this point of time of exposure; for it is the experience of all medical officers of health that nothing deters people from sending their clothes to be sterilized so much as the fact that they are frequently ruined by too long an exposure to the action of the steam. A certain amount of discrimination must also be used in determining what articles can be safely steamed; and an officer of health who ordered stamped plush, leather, skins, or water-proof material to be exposed to heat would render himself liable to be heartily laughed at by all practical men, whilst a washer-woman would be able to advise him that linen or similar material placed in contact with iron would be absolutely ruined by "iron-mold." Grease should always be removed if possible before the articles are put into the sterilizer, otherwise it becomes fluid, and is liable to spread to other parts. Blood and pus are, of course, coagulated by the heat at the same time as they are sterilized, and can be afterward removed by means of chlorine or other chemical solvents. Musty bedding and old clothes should on no account be put into the sterilizing chamber along with new articles and fine linen, as the fusty smell, which is never destroyed by the heat, is communicated from one to the other, and can only be got rid of by long-continued exposure to a plentiful supply of fresh air. Lastly, von Esmarch insists that disinfected clothing should not be sent back to infected rooms, and that in all large towns there should be some establishment to which poor people might be taken whilst their houses and clothing are being disinfected. It may be said that these are all truisms, but they are truisms that are constantly being forgotten, especially by men whose experience is not very extensive.

Astley Gresswell,$^{285}_{\text{Dec.,'90}}$ in a circular prepared for sanitary authorities and householders in general in Victoria, on the subject of the management of communicable disease, lays down the following rules: "1. Inform the council of your district, the school-teacher, and your employer. 2. Do not allow the patient, or any person who may carry infection from the patient, or any article or the house infected by the patient, to become a source of infection to other persons. 3. Get disinfectants. 4. Select and prepare a sick-room wherein to isolate the patient. 5. Remove to the sick-room the patient, together with the bedding, clothes, dirty linen, towels, handkerchiefs, toys, books, and other articles which the patient has recently been using. 6. Allow no person not absolutely required and no animal to enter the sick-room. 7. See that the attendant wears washing-dresses. 8. Hang up a cotton sheet outside the door of the sick-room, and keep it wet by dipping it from time to time in either the carbolic or the chlorinated solution. Boil this sheet every third day. 9. Wash dishes, cups, glasses, spoons, and other articles used in the sick-room in the carbolic or chlorinated solution, and then, if practicable, in boiling water. 10. Mix any remnants of foods (solid or liquid) with carbolic or chlorinated sawdust in the sick-room, and then either burn or bury them. Do not give them even to poultry, to cats, or to dogs. 11. Disinfect the surface of the floor-covering every other or third day by wiping it over with a duster moistened (slightly damp) in either the carbolic or the chlorinated solution, and then boil the duster. 12. Disinfect frequently the clothing and bedding, the towels and handkerchiefs, and other articles used about the patient (including those of the attendant). Do not send them to a general laundry.

13. Determine, if possible, whether anything recently taken by the patient, *e.g.*, any milk, water, or other beverage, ice or ice-cream, has been the cause of the disease. 14. Inquire into the condition of the domestic animals on or about your premises. 15. See that the house, the house-drain, the out-door premises, the closet, the right-of-way, and street-channel are kept as wholesome as practicable. See also that no pipe from the interior of the house is connected directly with any drain-pipe outside the house. 16. Do not allow the children of the household to play about the closet, or over the gutters in the street, or to take food with dirty hands. 17. Render innocuous all matters discharged by the patient. 18. Keep the patient isolated from the rest of the household until you have medical advice that there is no further need for isolation. A scarlatinal patient must be isolated eight weeks from the time of appearance of the rash, and as long as there is any peeling on any part of the body or any soreness of the throat. Persons recovering from small-pox or chicken-pox must be thoroughly washed daily, and they must be isolated as long as scales continue to form on the skin. In the case of measles, isolation must be maintained until the peeling of the skin is completed and the cough has wholly subsided. In cases of diphtheria, the nose and throat must have been thoroughly sound for at least one or two weeks before the patient may associate with healthy persons. In typhoid fever and infantile diarrhœa the isolation must be for at least two weeks after the patient has begun to get about. 19. After recovery, remove the patient in clean linen from the sick-room, and at once disinfect the latter and everything in it. 20. Should death occur, surround the body in the coffin with carbolic saw-dust, seal down the lid, and bury as early as practicable,—within twenty-four hours, if ordered by the officer of health. Do not remove the body into another room."

EPIDEMIOLOGY.

INFLUENZA.

During the recent epidemic *prior* to January 1, 1891, the number of cases of influenza in the State of Pennsylvania, as reported by Benjamin Lee,$^{2}_{\text{Jan.17}}$ was 1,120,000, and the number of deaths 7880, or at the rate of 1 death in every 142 cases. At the close of the year 1891 the influenza was reported as still violently epidemic in Berlin.[59, Jan. 2, '92] Influenza is reported[59, Feb. 26] as still prevalent as ever in Japan, 50,000 cases being reported among the Japanese in Yokohama alone. In Connecticut[146, Mar. 12] influenza re-appeared during the month of January, 1892. During the months of February, March, and April, 1891,[2148, '91] the influenza recurred in an epidemic form at Charleston, S. C., and Vineyard Haven, Mass. It was also reported as generally prevalent in the States of New York and California. In the State of New York the mortality from *la grippe* was 1000 for the month of March and 4500 to 5000 for April. Epidemic influenza[2, Apr. 4] appeared in the United States as early as March, 1891. In Chicago, Pittsburgh, Cleveland, and towns in Ohio the number of cases was very large, and the proportion of deaths unusually high. New York and other cities also suffered. In London[2, Apr. 25] and in some provincial towns, notably Hull and Sheffield, the disease prevailed, also, as early as March, 1891. During March only 9 deaths were attributed to influenza in London, but during the first nine weeks of April 19 deaths were attributed to the same disease. Up to April 25th few cases appear to have occurred on the Continent, but it was reported in Portugal, and is said to have been raging in North China since the beginning of the winter.

In New York, April 13th, 32 deaths were attributed to influenza,[2, Apr. 18] and for the week ended March 28th the deaths were 4; week ended April 4th, 48; week ended April 11th, 108. At this date, April 18th, 1891, the workings of the police and fire departments were seriously hampered by the number of men invalided by influenza. The life-saving stations on the Atlantic coast were crippled from the same cause. In Chicago and other Western cities there was no abatement of the disease. Some cases at this date had occurred at Nuremburg, the first patient being a man who had recently arrived from Chicago. Influenza was epidemic as early as the middle of March in Griffield, England, and had become prevalent in Hull, England, by April 18, 1891; but few cases at this date had appeared in London. In Frankfort 22 cases were reported for the week ended April 21st, and 38 cases in Copenhagen for the same week.[2149, Apr. 21] May 2, 1891, the influenza still prevailed severely in Yorkshire and Lincolnshire, in Leeds and in Sheffield, which at this date seemed to be the centre of the epidemic. In London, by this time, a large number of cases had occurred. Influenza was also reported as having broken out in Norway and in Sweden.

The influenza in Chicago is reported[59, May 4] as having very decidedly abated by May 2, 1891. It prevailed for a period of about a month or six weeks, and indirectly produced the highest mortality known in the history of the city. May 9th there was a large increase in the fatal prevalence of the disease, both in London and some of the largest provincial towns.[2, May 9] During the week ended May 16th the epidemic was extremely prevalent in the east end of London, and had become more or less prevalent in nearly all of the large provincial towns. In four of these provincial towns, namely, Bradford, Manchester, Leeds, and Sheffield, the mortality for the week ended May 16th was 40 per 1000. In London the epidemic had become extremely prevalent, and it had appeared in the Isle of Man and various parts of Wales, but up to that date the continent of Europe appears to have escaped almost altogether.[2, May 16] May 30, 1891, a further increase in the fatality in London was reported.[2, May 30] In most of the large English provincial towns there was a decline during the week ended May 30, 1891, from the exceptionally high rates prevailing during the preceding week, although the mean rate in the twenty-seven provincial towns dealt with by the Registrar-General exceeded the average by nearly 50 per cent. June 6, 1891, a slight decline was observed in London.[2, June 6] In North Lincolnshire the villages in the extreme north were attacked at the end of March, almost simultaneously with Yorkshire, but the epidemic was on the wane in the northern part of Lindsey. For the week ended June 16th there were 249 cases in London, and 489 cases in Copenhagen, with 11 deaths. Week ended June 23d there were 411 cases in Copenhagen and 14 deaths. Week ended June 30th there were 284 cases in Copenhagen and 9 deaths. June 20, 1891,[59, June 20] a large number of Indians in Alaska were reported as dying from the influenza. June 30th there was a marked decline for the week previous in London.

The *British Medical Journal* contains but few notes concerning influenza after the above date (June 30th) until October 31, 1891, on which date it reports[2, Oct. 31] the appearance of the disease in Galicia and a few cases in Vienna; also in Prussian Silesia and in Paris. The disease was also said to have arrived at that time in Melbourne, Australia, and adjacent country. November

7, 1891,[2, Nov. 7] influenza was said to be spreading rapidly in Silesia. An outbreak was also reported from the extreme southwest of England. The outbreak in Melbourne, Australia, was very severe. November 28, 1891[2, Nov. 28] it was reported to be spreading rapidly in France, being especially prevalent in the southwest, and had made its appearance in Paris. In Berlin the hospitals were said to be full, owing to the epidemic, which was also reported to be rife in Posen and West Prussia, in Hamburg, and Bremen. In Scotland, the focus of the epidemic at that date (November 28th) was Dundee, and Edinburgh had suffered a visitation. Seven deaths were ascribed to influenza in London for the week ended November 28, 1891, and the metropolitan death-rate arose to 20.1. December 5, 1891, the disease was prevalent in epidemic form over the east of Scotland and the west of England.[2, Dec. 5] It prevailed also in different parts of Scotland, Ireland, Australia, France, and in Germany and Austria, and in Portugal. About 40,000 cases of influenza were reported in Berlin during a period of four weeks in November and December, 1891. On December 19, 1891, the epidemic was reported as on the wane in Edinburgh.

CHOLERA.

During the calendar year of 1891 cholera prevailed at Hong Kong, Shanghai, Swatow, and Amoy, in China; at Galle, in Ceylon; in Bombay, Calcutta, Singapore, Madras, and Batavia, in the East Indies; in Hiogo, Yokohama, and Nagasaki Ken, Japan; Bangkok, in Siam; and in Aleppo, Beirut, Diabekir, Damascus, Tripoli, Cameran, Mecca, Medina, Antioch, Hama, Homs, in Turkey-in-Asia; and in Assyr and Yemens, two provinces of Arabia. The United States Consul at Singapore[146, Apr. 21] reported cholera prevailing to an alarming extent, but with no way of obtaining statistics. Neither have statistics been furnished from Shanghai and Swatow.

In Bangkok[2149, Mar. 24] the epidemic began January 3, 1891, and during January there were 20 to 30 deaths per day in a population of 500,000. The epidemic in Hedjaz is reported to have completely disappeared September 22, 1891. Up to August 19th of the same year there were 3154 deaths reported in the Hedjaz from the beginning of the present outbreak. As late as November 11, 1891, the United States Consul at Beirut, Syria, reported 118 cases and 93 deaths from cholera in the vilayets of Aleppo and Syria for the week ended that date.

According to a report made by Zavitziano[146] to the Marine-Hospital Bureau, in all the villages of Aleppo, from the outbreak of the epidemic on the 9th of June up to the 5th of November, there were 1659 deaths officially registered. At Damascus, from the outbreak of the epidemic there on the 11th of October up to the close of the year, there were 778 deaths officially registered.

Zavitziano[146] reported that from November 30th to December 19th there were 10 cases of cholera and 8 deaths reported. Under date of December 2d, the United States Consul reports that there is now no cholera in the city of Aleppo; but, for the week ended December 2d, 16 cases and 14 deaths were reported at Damascus. From August up to the middle of October there were many choleraic deaths among natives, China half-breeds, and Europeans in Batavia. During the week ended December 30, 1891, there were 22 cases of cholera and 22 deaths therefrom reported in the vilayets of Beirut and Syria. With regard to cholera in the Hedjaz, Saleh Soubhy[146] states that 46,953 pilgrims disembarked at Djeddah during 1891, and that only 25,253 returned to their homes, making the total victims to disease, chiefly cholera, 21,700. This statement relates only to pilgrims that arrived by sea.

The following is the table of mortality, arranged according to nationalities:—

NATIONALITY.	Disembarked.	Re-embarked.	Died or Disappeared.	Mortality per 100.
Javanese	10,817	6,920	3,897	33
Hindoos	11,067	4,784	6,263	56
Persians	1,954	969	986	50
Arabs	2,154	695	1,659	77
From Yemen	2,987	932	2,055	68
Soudanese	288	75	213	74
Syrians	5 091	2,699	2,392	46
Egyptians	6,712	4,689	2,230	33
Mogrebins	3,858	2,340	1,510	39
Buddhists	2,053	1,357	696	33

With regard to cholera in Arabia, intelligence received[146] at the close of the year shows the epidemic to be extinct in Assyr and Yemen. Official statistics place the number of choleraic deaths at Hodeida, Arabia, at 707. Unofficial statements place the number at 3000. The first case that occurred at Hodeida, October 9th, was introduced by means of a Turkish transport-ship. By October 17th the disease had become general. The last case occurred November 7th. The disease still prevails at Sana, Taas, Nedgih, and Sukelhams.

CHOLERA IN 1891.

(From the Records of the United States Marine-Hospital Bureau.)

COUNTRIES AND CITIES WHERE PRESENT.	DEATHS.											
	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
China.												
Hong Kong. . . .	. .	. .	. .	. .	. .	. .	. .	. .	1			
Ceylon.												
Galle	22	31										
India.												
Calcutta	108	526	258	84	75	56	11	38	88	188	201	154
(*a*) Singapore. . .	1	. .	1	1	2	. .	. .	. .	. .	1		
Japan.												
Hiogo.	. .	. .	. .	. .	. .	. .	. .	. .	. .	3		
Osaka.												
Siam.												
(*b*) Bangkok . . .												
Turkey-in-Asia (*c*).												
Aleppo	. .	. .	. .	. .	55	50	234	545	224	34	93	
Beirut and Syria .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	47
Damascus.	. .		. .	. .	. .	. .	. .	. .	. .	319	69	14
Tripoli	22	1										
Yemen	. .	. .	. .	. .	. .	. .	. .	. .	. .	13		

(*a*) Outbreak of cholera in Singapore, Shanghai, and Swatow, during August, 1891; no statistics. (*b*) United States Consul reports (under date April 21, 1891) cholera prevailing to an alarming extent, but no way of obtaining statistics. (*c*) February 18, 1891, United States Consul reports disappearance of cholera in various provinces of Syria. All quarantine restrictions removed. May 15, 1891, outbreak of cholera among 280 pilgrims from the steam-ship "Sculptor," landed at Camaran. June 9th, outbreak of cholera at Aleppo. July 17th, appearance of cholera at Mecca, Medina, and Antioch. Since outbreak of cholera to July 28th, 2594 deaths reported in Hedjaz; to August 19th, 3154 deaths. September 22, 1891, cholera reported completely disappeared from Hedjaz.

LEPROSY.

Much has been written within the past year with regard to the contagiousness or non-contagiousness of leprosy. It is not proposed here to give even an outline of these discussions, but to transcribe such notes upon the prevalence of leprosy in various localities and countries as have been mentioned in the journals and publications referred to. Leprosy is rare in the mountainous parts of Tonquin, but frequent in the Delta,[2] a village situated two kilometres from the French Concession of Hanoi, and numbers 400 inhabitants, almost one-half of whom are affected with leprosy. Eighty to 90 per cent. of the children of lepers contract the disease, which usually appears for the first time about the eleventh year.

In Russia,[2, Jan. 17] the number of lepers in Riga and its neighborhood amounts to about 100. The Leprosy Commission in India,[2, Feb. 7] have pursued their inquiries in Bombay and a number of other Indian cities, where some hundreds of cases have been personally studied, assistance being given by the civil surgeons, who have collected a considerable number of lepers for examination.[2, Feb. [illegible]] During the three months of the season in India, the Leprosy Commission traveled over the whole of Southern India, and examined between 1000 and 2000 cases of leprosy.

Hansen,[2, Apr. 4] referring to the necessity of segregation, cites the results of this provision in Norway, stating that in 1856 there were 2871 lepers in Norway and now there are hardly 800. In 1888 there were 817 lepers in Russia. Sixty-three cases were observed by Blanc in New Orleans during the past six years.

A petition praying for the compulsory segregation of lepers in the Leeward Islands was lately presented by the inhabitants of St. Kitts and Nevis. It states that leprosy is most prevalent in these islands, and that the number of persons afflicted with it is rapidly increasing. In the House of the Assembly of Cape Colony the Premier stated,[2, July 8] recently that it was the policy of the Cape government to co-operate with their neighbors for the purpose of collecting the lepers of South America in one place.

A case of leprosy is reported in Ulster, Ireland,—the son of a soldier who had been stationed in Rangoon, where the patient was born and resided for some years. The Local Government Board ordered that a room or ward in a small, detached building in the work-house grounds be made available for the care of the patient.

In September a case of leprosy was discovered in the person of a Chinese laundryman in New York, causing considerable excitement.[2, Sept. 19] Since 1866 5 deaths from leprosy have been reported in New York.[2, Dec. 19]

Kuusamo, Finland, was for a long time a small but obstinate focus for leprosy, 16 deaths having occurred between 1774 and 1800, and 22 between 1800 and 1828. In 1807 the lepers were isolated, and remained thus until 1845, when the hospital system was abolished, and the lepers were visited twice a year in their own houses by the medical officer of the district. After 1865 no further reports were presented, and in 1871 the medical officer reported that he was unable to find any more cases of leprosy in Kuusamo.

The United States Consul at Para, Brazil,[146 Jan. 23] states that the total deaths from leprosy for the year 1890 was 21, or about 1¼ per cent. of the whole mortality.

E. H. Plumacher, the United States Consul at Maracaibo[146 Nov. 18] states that it is estimated that there are 30,000 lepers in the departments of Boyaca and Santandeo, in the United States of Colombia.

The question of segregation of lepers in the United States has been recently the subject of some discussion, both in the newspapers and medical journals, and a recommendation to the effect that the national government shall establish a retreat for this purpose, and shall enact such necessary legislation as to make it effective, has been made by the Surgeon-General of the Marine-Hospital Service,[2148] and the matter has been presented to the appropriate committee of Congress, whose action is awaited with interest by the sanitarians of the United States, and by the several local or State boards of health who have had to deal with isolated cases of leprosy.

MISCELLANEOUS.

C. M. Galloway, physician to the Ohio Soldiers' and Sailors' Orphans' Home, at Xenia, Ohio,[275 Apr.] reports that in this home, which contained 913 children, 854 of whom were attending the school daily, *diphtheria* appeared September 29, 1889, and continued until April 15, 1890, during which time there were 214 cases among the children and 20 cases among the employés,—in all, 234 cases, with 35 deaths,—a mortality rate of about 14 per cent. *Scarlet fever*, in a mild form, made its appearance in the middle of October, 1889, and before it ceased, January 10, 1890, 240 cases came under treatment, with 2 deaths. Influenza made its appearance in that institution about the middle of January, 1890. Over 300 children were attacked and confined to their beds from four to eight days, and 100 more confined to dormitories for a few days, not being sick enough to be put to bed. At the same time all the hospital and convalescent wards, twenty in number, were filled with children sick and convalescing from diphtheria and scarlet-fever complications, and it was found that an influenza throat was a more fertile field for the ingrafting of diphtheria than was a scarlet-fever throat, every child dying that came into the hospital with this complication. The cause for these diseases was as follows: Scarlet fever was introduced by one of the children; influenza was almost universal throughout the State, and, as to diphtheria, it has prevailed in Xenia for the past four years, and was thought to be introduced by either employés or visitors. The cause for the continuance of the diseases was not due to either the overcrowded condition of the cottages or faulty methods of heating, ventilation, or plumbing, or bad water-supply. The continuance of diphtheria is attributed to the lack of hospital accommodations, which were sufficient for institutions containing 250 children, but were made to serve for one containing 950, the result of legislative indifference.

COMPARATIVE MORTALITY TABLE OF CERTAIN CITIES OF THE UNITED STATES FOR THE YEAR ENDED DECEMBER 31, 1891.

(As reported to the United States Marine-Hospital Bureau.)

CITIES.	Population, Census of 1890.	Total Deaths from all Causes.	Annual Rate per 1000 of Population.
New York, N. Y.	1,515,301	43,659	28.8
Chicago, Ill.	1,099,850	27,715	24.3
Philadelphia, Pa.	1,046,964	23,041	22.0
Brooklyn, N. Y.	806,343	21,349	26.4
St. Louis, Mo.	451,770	9,530	21.0
Boston, Mass.	448,477	10,571	23.5
Baltimore, Md.	434,439	10,073	23.1
San Francisco, Cal.	298,997	6,873	23.3
Cincinnati, Ohio.	296,908	6,636	22.3
Cleveland, Ohio.	261,353	5,204	12.2
Buffalo, N. Y.	255,664	6,001	23.4
New Orleans, La.	242,039	6,856	28.3
Pittsburgh, Pa.	238,617	5,823	24.4
Washington, D. C.	230,392	6,103	26.0
Detroit, Mich.	205,876	3,982	19.3
Milwaukee, Wis.	204.468	4,689	22.9
Newark, N. J.	181,830	5,155	28.3
Minneapolis, Minn.	164,738	2,272	13.7
Louisville, Ky.	161,129	3,087	19.1
Rochester, N. Y.	133,896	2,506	18.7
Kansas City, Mo.	132,716	1,643	12.3
Providence, R. I.	132,146	2,630	19.9
Indianapolis, Ind.	105,436	1,948	18.4
Toledo, Ohio.	84,434	1,475	18.1
Richmond, Va.	81,388	2,171	26.6
Nashville, Tenn.	76,168	1,803	23.6
Fall River, Mass.	74,398	1,813	24.3
Wilmington, Del.	61,431	1,237	20.1
Portland, Me.	36,425	630	17.2
Binghamton, N. Y.	35,005	678	17.8
Yonkers, N. Y.	32,033	671	20.9
Mobile, Ala.	31,076	787	25.3
Galveston, Tex.	29,084	698	23.9
Auburn, N. Y.	25,858	510	19.6
Newton, Mass.	24,379	373	15.3
San Diego, Cal.	16,159	1,891	11.7
Rock Island, Ill.	13,634	159	11.6
Pensacola, Fla.	11,750	257	21.8

Yellow Fever in 1891.

(As reported to the United States Marine-Hospital Bureau.)

Countries and Cities where Present.	Deaths.											
	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
United States:												
(*a*) Gulf Quarantine	. .	. .	. .	. .	. .	1						
(*b*) Pensacola Quarantine	. .	. .	. .	. .	. .	. .	1					
Foreign:												
Brazil.												
Bahia.												
Para	22	27	36	26	25	24	16	20	10	17	22	8
Pernambuco . . .												
Rio de Janeiro . .	36	123	904	926	1016	. .	190	106	62	105	5	
Santos	. .	. .	. .	. .	. .	. .	. .	. .	. .	22	101	143
Costa Rica.												
(*c*) Puentas Arenas.												
Cuba.												
Cardenas	. .	. .	. .	7	. .	.	. .	. .	1	1		
Cienfuegos	2	1	. .	. .	. .	.	1	2	2	13	5	2
Havana	11	4	4	5	7	43	65	67	47	49	26	17
Santiago de Cuba .	7	10	6	4	12	26	. .	. .	3	. .	1	
Ecuador.												
Guayaquil	. .	. .	. .	. .	. .	.	2	. .	3	14	7	59
Jamaica.												
(*d*) Kingston . . .												
Port Royal	.	. .	. .	. .	. .	. .	. .	. .	. .	. .	1	
Mexico.												
Merida	2											
Vera Cruz . . .	2	8	2	2	8	30	46	19	11	16	21	8

(*a*) Fourteen cases treated: June, 1 (died, Gronvelt); July, 4; August, 4; September, 5; convalescent upon reaching quarantine. (*b*) Engineer on steamer "Nigretia" died. (*c*) Yellow fever reported as existing in Puentas Arenas in December, 1891; no statistics. (*d*) Four cases in September.

SMALL-POX IN 1891.

(As reported to the United States Marine-Hospital Bureau.)

COUNTRIES AND CITIES WHERE PRESENT.	DEATHS.											
	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
UNITED STATES:												
(a) Cape Charles Quarantine . . .												
Connecticut. . . .	. .	. .	1									
Hardeeville, S. C. .	.	1										
(b) Harris Neck, Ga.												
Jamestown, N. Y.	1											
Kansas City, Mo. .	. .	. .	. .	1	. .	. .	. .	. .	1			
Memphis, Tenn. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	1	
New York State .	. .	. .	. .	1								
Philadelphia, Pa. .	. .	. .	. .	2	2							
Pt. Pleasant, N. J.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	2	
(c) Port Townsend Quarantine .												
St. Louis, Mo. . .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	1
Salem, N. H. . .	1											
San Antonio, Tex.	. .	. .	. .	. .	. .	. .	1					
San Elizario, Tex.												
(d) San Francisco Quarantine . . .												
Savannah, Ga. . .	3	5										
FOREIGN:												
Austria.												
Trieste	. .	. .	. .	. .	. .	1						
Vienna	15	14	68	52	64	36	39	17	5	15	2	4
Brazil.												
Ceara.	. .	. .	. .	1	1	1						
Pernambuco . . .	35	21	12	5	2	2	.	1	. .		. .	1
Rio de Janeiro .	39	15	13	42	63	. .	309	786	1000	738	97	
Rio Grande do Sul.	. .	. .	. .	. .	. .	. .	. .	7	2	3	2	1
Santos	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	5	3
Belgium.												
Antwerp	. .	3	. .	. .	2	2	6	. .	. .	. .	1	
Brussels	51	44	47	77	62	32	10	6	4	3	1	1
Ghent	1	1	2	. .	2	1	2	1	3	2	5	2
Cape Verde.												
Medillo	. .	.	. .	. .	. .	5	2					
Canada (*e*).												
Ceylon.												
Colombo	49	52	11	18	6	2	. .	. .	. .	. .	1	
Galle	. .	. .	6									

(*a*) Steamer "Helmsley," 5 cases. (*b*) Outbreak of epidemic August 16, 1891; 12 deaths to November 16; only 1 death from November 16 to December 31. (*c*) Two cases on board "City of Pekin." (*d*) Eight cases on "City of Rio de Janeiro." (*e*) Small-pox believed to have been brought by steam-ship "Brazilian" from Montevideo *via* London; first case on board vessel April 22; there were 149 cases and 31 deaths to December 28, 1891.

SMALL-POX IN 1891 (*continued*).

COUNTRIES AND CITIES WHERE PRESENT.	DEATHS.											
	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
Chili.												
Concepcion City .	27	8	14	8	14	16						
China.												
Hong Kong. . . .	. .	. .	4	8	1							
Cuba.												
Havana.	2	2	2	14	27	33	30	28	. .	1	. .	1
Santiago de Cuba .	1											
Denmark.												
Copenhagen. . . .	. .	5										
Ecuador.												
Guayaquil.	39	17	9									
Egypt	4	6	9	16	15	11	. .	. .	. .	. .	. .	14
England.												
Liverpool	. .	. .	. .	. .	1	. .	. .	. .	. .	. .	1	
London	. .	. .	1	2	1	3	1					
France.												
Lyons	. .	. .	. .	. .	. .	. .	. .	1				
Marseilles.	87	55	48	40	32	22	23	23	10	13	21	13
Nice	. .	. .	2	1	2	1	1	. .	. .	1		
Paris	5	8	8	1	2	2	3	4	1	2	. .	1
Rheims	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	1	1
Germany.												
Bremen.	1	. .	1	. .	. .	. .	. .	2				
Leipzig	. .	. .	. .	. .	. .	. .	1					
Prague	8	5	3	1	3	2	1	2	2	8	10	7
Holland.												
Amsterdam . . .	. .	. .	. .	. .	1	2						
Honduras.												
(*f*) Tegucigalpa .												
India.												
Calcutta	. .	2	3	1	1	1	1	1				
Singapore.	. .	1	. .	2	3	2	3					
Ireland.												
Belfast	. .	. .	. .	. .	1	2						
Italy.												
Genoa	3	1	. .	. .	. .	. .	. .	. .	. .	1	. .	2
Milan.	1	. .	. .	. .	1	1						
Rome.	2	.	2	1	. .	. .	. .	. .	. .	1	1	
Venice	17	1	1	. .	. .	. .	. .	1	. .	1		
Madagascar.												
(*g*) Tamatave. . .												

(*f*) Seventy-three cases and 6 deaths reported April 4th. (*g*) August 9, 1891, several cases declared.

SMALL-POX IN 1891 (*continued*).

COUNTRIES AND CITIES WHERE PRESENT.	DEATHS.											
	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
Madeira.												
Funchal	5	1	4	2								
Mexico.												
Matamoras	2	. .	1	.	. .	1						
Tuxpan	. .	1										
Vera Cruz	. .	. .	. .	.	. .	. .	1					
Norway.												
Christiania	. .	. .	1									
Russia.												
Moscow	. .	. .	. .	. .	7							
Odessa	. .	. .	1	4		1	. .	. .	. .	. .	1	1
Warsaw	23	9	11	7	5	13	12	12	4	8	12	13
Scotland.												
Glasgow	.	. .	. .	. .	. .	. .	. .	1				
Sicily.												
Messina	4	2										
Spain.												
Barcelona	18	16	24	24	24	15	17	9	10	11	8	9
(*h*) Cadiz	. .	.	. .	5	2	2	4	5				
Jerez de la Funtera	17	17	12	4	9	5	2	5	2	9	7	1
Switzerland.												
Zurich	. .	. .	. .	1	1	. .	4					
Turkey.												
Constantinople	. .	.	. .	. .	. .	. .	. .	35	45	. .	40	37
West Indies.												
St. Thomas	. .	. .	. .	. .	3	1						

(*h*) October 29, 1891, epidemic of small-pox reported.

ANOMALIES AND MONSTROSITIES.

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ANOMALIES.

Head and Thorax.—Schattenberg[708, p.119,'89] reports the case of an idiot, 57 years of age, whose left extremities had been deformed from childhood. At the autopsy the right hemisphere was found to be very defective; frontal, parietal, and temporal lobes being nearly absent. The central and the first temporal convolution and the largest part of the island of Reil were wholly wanting, their places being occupied by a sort of bladder filled with cerebro-spinal fluid. Jules Akerman[366, B.23,H.1,2] tells of a child, 1 month old, which had, extending from the right root of its nose, a finger-like growth, three centimetres long, with a central opening like a urethra. Operation resulted in a cure.

A child is described by Rydygier[386, No.26] which had a tape-like growth extending from the alveolar process of the superior maxilla to the inferior, and preventing the opening of the mouth. There was also a bridge-like growth from the lower to the upper lid and webbing of the four external toes of both feet. W. H. C. Stavely[6, Sept.26] mentions a symmetrical deformity of the face in two children of the same mother. The nostrils extended almost up to the inner canthi of the eyes. One of the children had also imperforate anus, for which colotomy was performed, but with fatal result.

Ivan Svoff[200, July 26] showed the body of a male infant with two noses blended in the median line, each with separate vomer. The prominent chin was apparently formed by the coalescence of two jaws, and on either side of the chin-like protuberance was a triangular mouth, supplied with well-developed lips and each containing a tongue. The child had lived for several days.

G. F. Keiper[1, Sept. 12] reports a case of congenital microphthalmus in a man 20 years of age. The eyeball was one-third normal size; cornea rudimentary; iris one-fourth natural size, and completely fitting the space ordinarily occupied by the pupil. A child who died nine hours after birth is mentioned by F. U. Ferguson,[700, Aug. 8] in whom the tongue was retracted, the tip pointing toward the roof of the mouth and rendering nursing impossible.

James Cantlie[2, June 6], details a peculiar case of abnormality in the head of an adult Chinaman. There was unilateral absence of ear, bilateral supernumerary auricles, and, in addition, considerable developmental deformity of the right side of the face, consisting mainly of absence of facial nerve, undeveloped right eyeball, and an almost infantile right nostril. A. E. Giles[2, Feb. 21] exhibited an abnormally narrow skull from a man of weak intellect, who had died at 40. There had evidently been premature fusion of the parietal bones.

R. Staderini[25, May] records an abnormality that has been observed but four times. It consists in complete absence of the nasal bones, their places being occupied by apophyses springing from the superior maxillæ.

P. J. McGillicuddy[1, May 9], tells of a woman, 34 years old, who, in the third month of each of her two pregnancies, found the axillary glands filled with milk. There were distinct areolæ, but no nipples, the milk exuding through the pores of the skin. B. F. Bartho[186, July] mentions a case of well-developed supernumerary breast under the right mamma of a young mother of 20. The child could nurse from this breast as well as from the normal ones. A healthy girl is described by T. Kurokawa[200, Aug. 31] as having a supernumerary breast, about the size of that of a girl of 10, at the lower border of each pectoralis major, near the axilla.

A strange deformity was noticed by E. E. Williams[199, Feb., '90] at the autopsy on the body of a single woman who died of diarrhœa at the age of 82. Instead of being in its normal position, one of the mammæ was on the back, just under the shoulder-blade. In addition, the vagina opened above the pubis, and was about an inch long. The anus was where the vaginal opening should have been.

M. Paul[187, July] showed a little girl, otherwise well formed, in whom the pectoral muscles of the right side were entirely wanting. E. Evelt[2, Sep., Oct. 24] mentions a case of supernumerary nipples.

W. Roger Williams[277 Jan.] contributes an exceedingly interesting article upon "Polymastism, with Special Reference to Mammæ Erraticæ and the Development of Neoplasms from Supernumerary Mammary Structures," in which he objects to the extraordinary view, recently advanced, that in human beings highly specialized organs like mammæ and teeth, which have taken immense ages to attain their present degree of perfection, can be suddenly evolved as "*spasts*" from ordinary sebaceous glands and cutaneous processes, respectively, he being decidedly of the opinion that the mamma is the homologue of but a single sebaceous gland. In the numerous well-recorded cases of supernumerary structures now available there are ample materials for reconstructing the mammary arrangement of the ideal human *atavus* on a really scientific basis. From this source it may be gathered that our early progenitors had at least seven pairs of mammæ on the ventral aspect of the trunk; of these only the

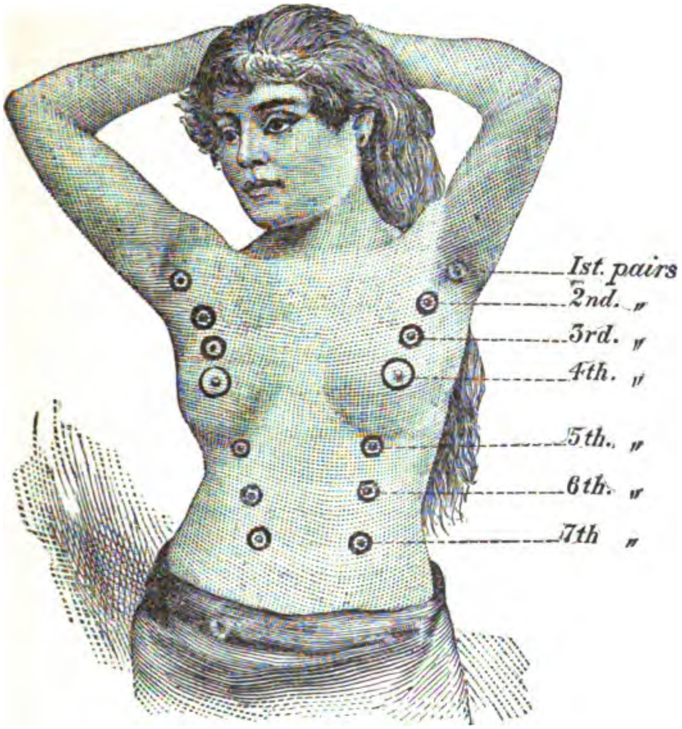


DIAGRAM SHOWING THE MAMMARY ARRANGEMENT OF MAN'S EARLY PROGENITORS. (*Journal of Anatomy and Physiology.*)

present pectoral pairs have survived. Of the six lost pairs, three were situated above and external to the present pair, and three below and internal to them (*vide* figure). In human beings, it is a significant fact that the additional mammary structures develop only in certain definite positions, which almost invariably correspond with those occupied normally by the glands of polymastic animals.

L. G. Hardman, of Harmony Grove, Ga.,[61 Nov.,'92] describes a case of supernumerary mamma, of especial interest from the fact that the mamma did not develop until the fifth gestation, there being, according to the patient, no sign of it before that time.

The subject was colored, aged 39, married, and had six children. Her health was good. Three years ago she was delivered of a child, and at that time observed a lump under the left armpit, soft and movable, and not sore or tender on pressure.

One month after delivery she noticed that this lump was increasing in size until it became as large as a hen's egg. It remained so for two years, which was the period during which she nursed the child. It then seemed to disappear until about three weeks before her next confinement, when it again became as large as a hen's egg, continued to grow, and was somewhat painful. When the child was 2 months old it had reached the size of an orange. There is no nipple and no discharge of milk, but the tumor is soft and full of milk. Hardman compared the secretion from the tumor with the breast-milk, and found them to be identical, the fat-globules being easily made out under the microscope.

Hardman considers the case unique, as he can find none with a similar history. Bruce has examined 4000 persons, and finds the anomaly in 1.54 per cent. He states that the axillary prolongations are not infrequent, and may be mistaken for lymphatic glands. The left side is the most common locality of these supernumerary mamma.

David Wallace showed to the Medico-Chirurgical Society of Edinburgh,[36 Feb.,'92] a case of true cervical rib in a living subject. The resemblance to an exostosis was very close, so that a mistake might easily have been made in diagnosis. The patient was a man of 60 years, who suffered no pain or discomfort in the arm; nor had he previously had his attention called to the swelling, which was in the right supra-clavicular region.

An interesting congenital malformation of the ribs is described by J. T. Osborne.[51, May] The right side of the patient—a boy of 13—was normal; on the left the first rib was present, but there was a gap of about an inch between the second rib and its cartilage. The third and fourth ribs sloughed strongly downward, leaving a space of some three inches between them and their costal cartilages. The remainder of the ribs were normal.

W. F. Rochelle[74, Dec.,'90] discovered at the autopsy on the body of an adult male, who died of a profuse hæmorrhage from the lung, that the right lung was rudimentary, being only about three inches in length, and weighing perhaps 2 ounces. The heart was on the right side. M. Rogie[220, Mar.27] mentions an instance of but two lobes to the right lung of a fœtus.

Heart and Arteries.—A remarkable case of congenital malformation of the heart has been recorded by C. Cipriani.[854, B.2,p.10] The subject, a male, lived to the age of 20, having been markedly cyanosed all his life. There was transposition of the lungs, and the heart lay on the right side. This organ consisted of only two chambers,—a lower conical one with a rudimentary septum at the apex, whence proceeded the pulmonary artery (with stenosed orifice), and the aorta. The upper chamber was somewhat narrowed where it was connected with the lower one, and at this spot was a rudiment of a valve. Neither this valve nor those of the pulmonary artery and aorta were competent. The liver occupied both hypochondriac regions, and its left lobe was much more developed than the right. The spleen was hypertrophied, and had a horizontal furrow across its middle portion, whilst in the vicinity were three other spleens, each the size of a fowl's egg. The stomach was very small and atrophied. The duration of life under these circumstances is not the least singular feature of the case.

T. C. Biddle[72, Jan.] mentions a case of dexiocardia in a boy of 10, who suffers no inconvenience from the abnormality.

E. Ewart[2, Feb.21] showed to the London Medical Society a man of 28 years, in whom the heart was on the right side, but the rest of the viscera were not transposed. Resection of the ribs and pulmonary incision had been performed for bronchiectasis; so it was thought the displacement might be due to retraction of the right lung, and not congenital. In the case presented by Schmidt[18, June] the patient, a man of 25, suffered no inconvenience.

Oldright,[39] mentions a girl of 20 who died one week after recovering from an attack of right hemiplegia. The autopsy disclosed a patent ductus arteriosus, with vegetations on pulmonary side of the duct, the escape of one of which probably caused the apoplectic seizure.

A child that died, four days after birth, from dyspnœa, is described by Shaw[39] as having the aorta arise from the right ventricle together with the pulmonary artery. The ductus arteriosus was patent, the foramen ovale also, and the interventricular septum was incomplete.

E. Fairfax Ross[267] showed a young man who suffered from intense dyspnœa with cyanosis on attempting the slightest physical exertion. There was probably patent foramen ovale. Stefani[366] reports a case of partial obliteration of the arch of the aorta and incomplete interventricular septum. Graanhoom[114] relates a case of dexiocardia with transposition of all the large blood-vessels.

Kollman[2059] presented cases with the following anomalies: (1) absence of inferior vena cava; (2) congenital low insertion of kidneys, with double veins; (3) anomalies of the arteries of the kidneys; (4) of the obturator artery; (5) of the arteries of the upper extremities; (6) of the arch of the aorta, with 1 case of left subclavian ending behind the œsophagus; (7) 2 cases of horseshoe kidney; (8) rudimentary development of cervical rib.

Two cases of anomaly of the left subclavian are described by J. G. Sherrill[1]: In 1 the thyroid arose by separate trunk from the first portion of the artery, whilst the supra-scapular and the transversalis colli originated by a common trunk from the same portion. The internal mammary arose from the third part. In the second case the internal mammary took origin from the thyroid axis in addition to its usual branches. Ortner[84] reports 3 cases of marked diminution of all the arteries in patients from 17 to 30 years old.

Œsophagus.—Foster Vince[2] found, at the necropsy on the body of an infant who died after forty-eight hours, that the œsophagus ended in a fibrous cord about one inch below the pharynx. The gastric extremity of the œsophagus was normal below, but grew smaller as it ascended, and opened into the trachea between the cricoid cartilage and the first tracheal ring. An instance of imperforate œsophagus is also given by Machell.[39]

Soluskha[90 Dec.,'90] records an interesting case of quadruple spleen accompanied by transposition of the abdominal visceræ. There was an individual artery to each spleen, as well as an intercommunicating system. Emelianoff, commenting on this case, says he once came across a similar case of four spleens.

Stomach and Intestines.—Generisch[22 July 8] reports a case of abnormal enlargement of the pancreas. In addition, a narrow band of this organ's glandular substance passed around the duodenum, constricting it to the thickness of the thumb, thus indirectly causing enlargement of the stomach, with hypertrophy of its walls. The result of the autopsy on the body of a child who died, four days after birth, from intestinal obstruction, is told by J. C. Oliver.[53 Aug.15] The small intestine ended at the lower portion of the ileum in a blind pouch. Immediately below this was the large intestine, opening into the peritoneal cavity. There was no fibrous cord or other connection between the two, and nothing that answered either to an ileo-cæcal valve or to an appendix vermiformis; otherwise the child was perfectly formed. G. H. Cox,[157 July] in an infant that died one day after birth, found the small intestine ending similarly. In the left iliac region was another tube, filled with soft fæcal matter until within two inches of the anus, which was patent.

A child that lived five days was described by Schoonmaker.[157 Sept.] The stomach and intestines ended in a *cul-de-sac* on a level with the pylorus, with no fibrous connection with the intestines below. The stomach was divided by a constriction into two unequal pockets, which possibly corresponded to stomach and duodenum.

At the autopsy on a child that lived for five days O. A. Fliesburg[105 Oct.1] discovered total occlusion of the cæcum, rudimentary pancreas, absence of duodenum, the jejunum ending in a *cul-de-sac.* There was no connection either between stomach and intestines or between intestines and gall-bladder.

A. A. Lendon[267 May] mentions a case of patent vitello-intestinal duct, for which operation was performed, but without success, the child dying. R. Coltman, of Tĕng Chow Fu, China,[673 Oct.] corresponding editor, reports a case of situs viscerum inversus in a Chinese boy of 19. Another instance is mentioned by W. B. Haddon.[6 Nov.29,'90] As has often been observed in such persons, his patient was left-handed. He, however, does not believe that the left-handedness is due to the visceral transposition, but to a reversal of function in the cerebral hemispheres, quoting Hughlings Jackson to the effect that the left hemisphere is "like an elder brother, who takes and keeps the lead through life."

A. E. Roussel, of Philadelphia, delivered a case of ectopia abdominalis. This child had the left arm markedly shortened, with three astonishingly long fingers attached to the hand. S. H. Price[760] reports a somewhat similar condition in a fifth month fœtus.

Simon[84] reports a case of ectopia abdominalis in a full-grown fœtus, in which the opening extended from pubis to sternum. The right anterior abdominal wall was adherent to the posterior. The transverse colon, anus, left testicle, and left leg were absent, and there was but rudimentary development of the left foot.

J. A. Gauthier[2] mentions the case of a child born at term which lived one hour. The autopsy showed a deficiency in the left side of the diaphragm, through which the stomach, spleen, pancreas, and most of the small intestine had passed into the pulmonary cavity, having by their pressure arrested development of the left lung, so that it was no larger than a kidney-bean.

Calbet[7] notes a case of hernia abdominalis consisting of stomach and intestines. Perslow[2] mentions a case of hernia of the intestines into the umbilical cord.

Karl Abel[132] records an interesting case of a young woman of 20 who, from birth, had passed her motions through the vagina. Examination showed that the rectum opened into the vagina slightly in front of the fourchette. A serviceable sphincter was present, and the woman had as good control of her fæces as if the arrangement had been normal. A child who died on the eighth day, of acute peritonitis, the result of imperforate rectum, was found at the necropsy, by N. L. Wilson,[1] to have the rectum end in a blind pouch attached by a fibrous cord to the bladder. E. J. Morris[23] mentions a child which lived for six days, in which the anus was patent, but the rectum ended an inch and a half above. No operation was attempted, as the child was *in extremis* when seen. L. H. Davis[74] operated on a case of imperforate anus, but the child died two days afterward. S. Paget[2] showed three specimens of imperforate rectum, in all of which operative means had been tried, and in all of which the children died. Longyear[185 May] had a patient of 21, in whom there was congenital absence of the sphincter ani.

John Morgan[2 Nov. 29, '90] showed 2 cases of coccygeal tumors that resembled tails. With regard to the tail in human subjects, Oscar Shaeffer[2 Sep.-June 20] describes several cases, in all of which, however, the subject was a fœtus with distinct malformations. In no instance was there a true caudal appendage bearing a continuation of the vertebral column.

Genito-Urinary Organs.—Louis Mitchell[779 May] records 7 cases of anomalous kidneys. Two were horseshoe kidneys,—an anomaly that occurs once in about 1600 persons; 2 instances of unsymmetrical kidney, the right being absent; 2 of double ureter to one of the kidneys, and 1 instance of triple ureter on one side, double on the other. A curious fusion of the kidneys is described by Drappier.[220 May 1] Instead of the regular horseshoe shape, the inferior portion of the right kidney was connected with the superior part of the left, and each kidney had two ureters. Instances of but a single kidney are noted by Ries[34 Mar. 10] and by M. E. Bitot.[188 July 5] Edmund E. King, of Toronto,[245 Nov.] presented specimens of complete double ureters of both kidneys. King said that in 10 post-mortem examinations made by him he had found 3 cases of supernumerary ureters. Three cases of exstrophy of the bladder were reported. In J. N. Ellis's instance[81 Aug.] there was also congenital absence of the vagina; connected with the one detailed by M. Porak[24 May 10] there was anus imperforatus, and also entire absence of the external genital organs.

Several so-called hermaphrodites have been described this year; in one or two the sex could hardly be differentiated. A young negro of 21 was examined by G. T. Vaughan.[1 Jan. 31] The patient was apparently a boy of 15, with beardless face and feminine voice and form, four feet eleven inches tall. Enlarged mammæ were found, and a small, flaccid penis, two and one-half centimetres long, perfect, with the exception of a meatus. The frænum, as it descended, divided into labia externa, embracing the meatus at the point of division. The labia externa, formed of the scrotum by means of the frænum, were of unequal size, the right being the larger, and containing two glands. The lower felt like a testicle with cord extending from it; the upper was sensitive to touch, and the patient said it swelled and grew painful once a month. The patient said that her desire was for women, and that she had several times had connection with women, but without experiencing pleasure. Rectal examination disclosed a small uterus with an ovary beside it, and, three days after admission to the hospital, blood was found on the labia, undoubtedly from menstruation; thus proving her to be a female, though a cursory examination would incline any one to call her what her parents had heretofore considered her,—a boy. A case of perineo-scrotal pseudo-hermâphroditism is described by Paul Petit.[194 May] The subject, aged 20, had been christened and brought up as a woman, was of moderate height, had long hair, a masculine expression and voice, a downy moustache, and flat breasts. The sexual desire was toward males, coitus was easy and pleasurable, but without emission. No menstrual flow or molimen had been noticed The penis was well developed. A ridge of skin ran from the glans along the groove between the cavernous bodies, dividing posteriorly into three parts, the lateral divisions being continuous with rudimentary labia minora, the median segment running to and around a meatus urinarius of the female type. Behind the meatus was the vaginal orifice, which bore a rudimentary hymen, hardly admitted the little finger, and led to a canal over two and one-half inches long. The labia majora were well developed. No uterus could be detected. No testes lay in the labia or inguinal canals. On rectal exploration a firm, reniform, movable body could be felt to the left; it was probably a testicle.

C. N. D. Jones[59 Dec. 27, '90] removed hernial tumors from the inguinal canal of a pseudo-hermaphrodite, which proved to be testicles, though the external sexual organs were those of a female; the vagina, however, ending at two inches in a *cul-de-sac.* The patient was 20 years old, and had always passed for a woman. A sister is said to be affected in like manner. A man of 40 is mentioned by L. A. Frost,[2060 Dec. 19, '90] whose sexual organs so resembled those of a woman that, when a child, he was dressed as a girl and called Elizabeth, and afterward married to a man before the true sex was discovered.

"Jatros"[176 Nov.] reports the case of a child well developed, with the exception that the genital organs were entirely wanting. An inch and one-half below the navel was an opening two inches long, through which the rectum protruded. The child died on the thirteenth day.

Hugh Woods[2, Sept.19] says that, in a middle-aged man who consulted him for urethritis, he found two urethræ, one above the other. They were separated by a fleshy septum, and both completely formed. The man was unaware that his condition was unnatural, believing the upper to be the urinary the lower the genital passage. During the inflammatory attack, for the first time urine was passed through both orifices, though previously it is probable that the upper passage had been a mere *cul-de-sac*, as is usual in such cases. Another instance of double urethra is recorded by Hugh Woods.[2, Dec.3] Soumeau[188, Aug.28] mentions a child of 2½ years, whose glans penis was imperforate at the end, the urethral orifice being situated in the under part of the head. Geo. Brown[786, May] details an interesting case of pregnancy in the left horn of a perfect specimen of uterus bicornis. At 6 months there was a profuse hæmorrhage, which stopped of its own accord. At term, with no unusual difficulty, a small, deformed child was born, which died in an hour. An operation performed, a year afterward, for an ovarian cyst, disclosed the condition. Massey[28, Mar.] was consulted by a woman for leucorrhœa six months subsequent to the birth of her first child. He found the remnants of a septum that had separated the two vaginæ and two uteri,—one normal, the other rudimentary. A. M. Williams[82, May 16] also had a case of double vagina,—one ending in a *cul-de-sac*, the other leading to a normal uterus. Instances of absence of vagina or uterus have been comparatively frequent. H. W. Carpenter[61, Feb.28] mentions a case of complete absence of uterus in an otherwise well-developed married woman. The vagina was four inches long and ended in a *cul-de-sac*. J. T. McShane[61, Feb.21] reports an almost exactly similar instance. Delagénière[17, Apr.7] reported to the French Surgical Congress the case of a woman of 23, who was destitute of uterus and vagina, but in whom the presence of ovaries was manifested by periodical attacks of pulmonary congestion. The ovaries were removed and the attacks of congestion ceased. K. Frank[398, B.18,H.2] had an almost similar case, for which he removed the ovaries.

Mabaret[25, Mar.] describes 2 interesting cases of absence of part of the genitalia in two sisters, aged respectively 42 and 33. Both were tall and strong, brown in color, with thick hair, harsh voices, and somewhat masculine figures; breasts rudimentary; vagina, vulva, and nymphæ were wanting; a small orifice between the urethra and the anus allowed the escape of the menses without much trouble. Additional cases of absence of uterus and vagina are mentioned by Balade,[188, Oct. 4] Jouin,[24, Aug. 16] Loviot,[2, May 8] von Swiecicki,[2, Sep., May 18] and J. M. Richards.[112, Jan.]

Extremities.—Joachimsthal[41, Feb. 13] presented a boy of 5 years, with congenital luxation of both hip-joints and spina bifida. A case of entire congenital absence of the right leg, the left being represented by only a short stump, and absence of both forearms, is noted by Rydygier.[336, No. 36]

Geissendörfer[336, No. 13] describes a case in which there was a complete absence of the radius in each arm. Both hands had five well-formed fingers. He says that, according to Gruber, absence of the radius has heretofore been noticed only when associated with club-hand and absence of one or more fingers or one or more carpal bones.

An instance of congenital inequality in the length is reported by B. E. Mackenzie.[39, May] Hutchinson,[806, Jan.] commenting on heredity in reference to disease, remarks that, though congenital distortions of the feet are common, those of the hand are rare. He cites a case of peculiar deformity in a man's hands, which was also reproduced in those of his son. The middle, ring, and little fingers were all turned toward the ulnar side, and at the same time somewhat bent toward the palm at the metacarpo-phalangeal joint.

Bruner[20, B. 134, H. 2] reports a case of congenital absence of both patellas, with subluxation of both hip-joints.

T. B. Darling[36, Mar.] exhibited an infant with supposed intra-uterine amputation of right hand. Since at the end of the stump there were five little nodules, the case looks rather like an instance of arrested development. E. H. Bennett[16, Jan.] reports the dissection of an almost exactly similar deformity, which he also regarded as an arrest of development. Three cases of abnormal development of the extremities are mentioned by Goldmann[761, B. 7, H. 2]: (1) congenital atrophy of certain of the metacarpal and metatarsal bones in a girl of 16; (2) a man of 35, with but one toe on each foot and two fingers on each hand; (3) like the second case, with regard to the feet, but with a single finger on each hand. Kummer[853, No. 3] records a case of congenital syndactylitis of the third and fourth fingers in a boy of 7. Booker[764, July, '90] exhibited a case of dactylitis in a child of 16 months. Another instance of this malformation is reported by Guermonprez.[220, Aug. 28] M. A. Smith[9, May 2], says that 2 out of 3 children in a certain family had a supernumerary digit attached to the outer side of each little finger.

Ernest B. Sangree observed a supernumerary digit attached to the little finger of each hand in one of twins. Another instance of supernumerary digits—six on each hand—is mentioned by Rogie.[220, Nov. 27] Shepherd[282, June] exhibited the left forefoot of a pig with six toes. N. S. Hill[53, July 26] says that monodactylous pigs are not uncommon. Two cases of supernumerary thumb are reported by Loviot[194, June] and Levraud,[182, Aug.] respectively.

Saville[806, Jan.] relates a singular instance of heredity in relation to a deforming disease. The case was that of a single woman of 38, rather stout and pale, a cook by occupation. She has already lost the anterior halves of both feet by a slow, painless, necrotic process. She says that two of her brothers have suffered in the same way, and believes also that her maternal grandmother was similarly affected.

MONSTROSITIES.

Ballantyne[2, Sept. 26] remarks that the peculiar features of monsters are frequently destroyed by the ordinary method of preserving these specimens in alcohol, and thinks that, as a rule, a better method is to remove the skin and properly stuff it. An editorial[2, Aug. 22] refers to the need of a good English illustrated teratology, states that there is a wealth of scattered material, and suggests that obstetricians be more careful in examining abnormal products of pregnancy. Certain monsters, such as acephalics, are not likely to be overlooked, even by the most ignorant and careless; consequently, we find quite a list of them reported. But such a monster as an acardiacus acarmus—a rudimentary head without a body—is extremely rare, but may be more common than supposed, as it is very liable to be mistaken for a "false conception."

Anencephalus.—E. Giraud[101, Aug. 1] records a case of this defect, in which there was also spina bifida of the cervical and dorsal portions of the vertebral column. He relates an instance which would seem to form strong evidence in favor of the theory of maternal impressions. The specimen referred to above was accidentally seen by a woman some two months pregnant, and greatly frightened her. Six weeks afterward she miscarried, the result being a monster remarkably similar to the first in lack of development. Hugo Gubert[12 Sept.] described a specimen of 7½ months, which lived a few minutes after birth. Grawitz,[41 Jan.28] saw an anencephalic child that lived twelve days, moaning constantly, and requiring to be fed with a spoon. Two cases are described by Pauthier.[24 Feb.1] A young peasant girl gave birth to the first, which lived several hours, dying, apparently, of neglect, after the doctor had refused the family's request of him to kill it.

W. Armstrong[6 Mar.21] describes a monster of this variety, in which there was also spina bifida the whole length of the vertebral column. J. B. Reynolds,[856 May] F. B. Kitchen,[86 Sept.] P. Schoonmaker,[157 Sept.] W. B. Wood,[139 Jan.] M. Villard,[46 Jan.30] M. Arnaud,[46 Jan.30] each describe an instance. In the case reported by Louis Charbonne[189 Jan.] there was also spina bifida of the first four cervical vertebræ.

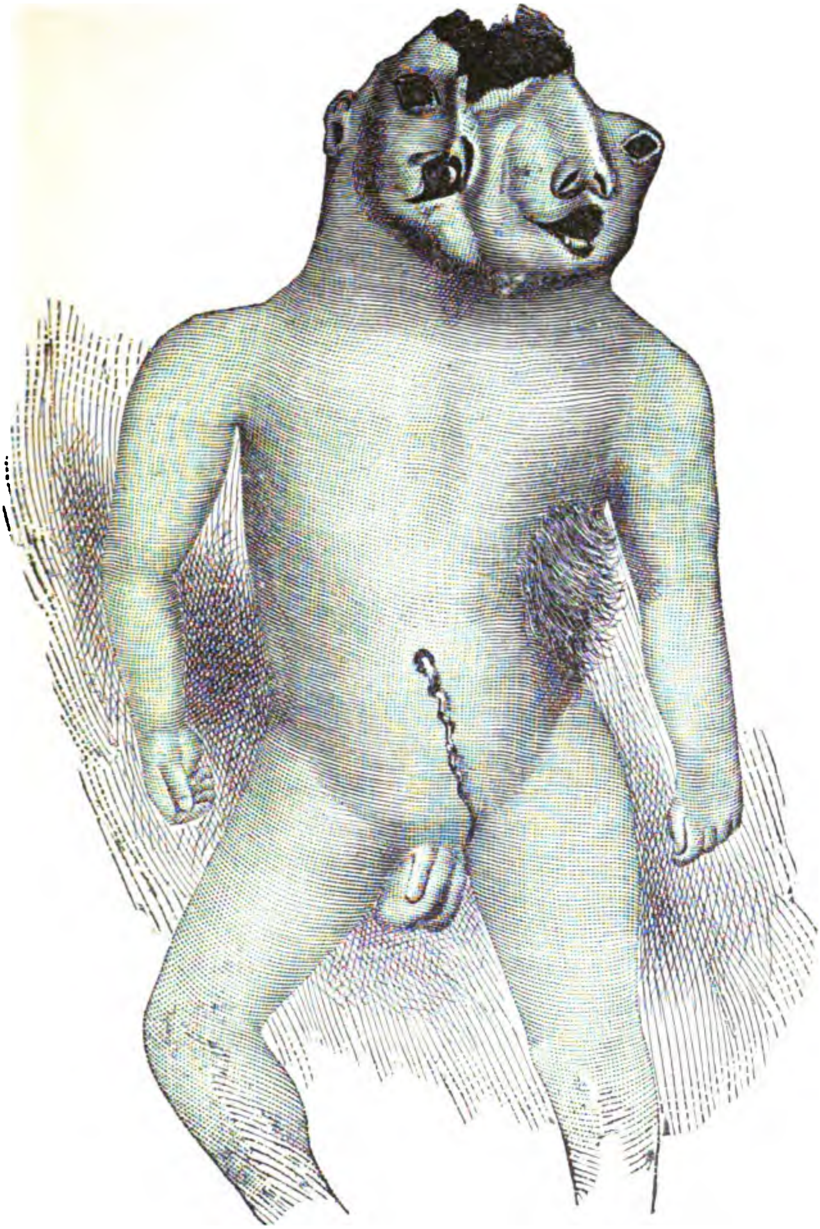
Acrania.—W. P. Watson[51 Feb.] presented a specimen of this monstrosity, the second of its kind born of the same mother. The specimen described by G. D. Swaine[186 Feb.] weighed at birth 14 pounds, and was perfectly formed up to the shoulders, but destitute of head and neck. He also delivered a fœtus whose hands and carpal bones were wanting. H. C. W. Showalter, in a communication, describes a case that was also accompanied by spina bifida. W. C. Hall[82 Mar.14] had a case in which there was normal development, with the exception that there were neither cranial bones nor encephalon. Foster[61 Apr.1] saw a case of hemicephalus in a fœtus of 7 months, together with hydramnios.

Microcephalus.—In the case reported by Arnaud[46 Jan.30] there was no intelligence, the child living a purely vegetative life for nineteen months. At the autopsy 120 grammes (4 ounces) of serous fluid were found in the cranium. The encephalon was about one-tenth the natural size.

Giacomini[126 Oct.] thinks that the process is localized in the central nervous system, and that there is no such thing as primary osteo-microcephalus, believing it to be always neurotic. Another instance of this monstrosity is reported by Guéniot.[10 July 28]

Hydrocephalus.—Quincke[69 June] reported several cases of acute and chronic hydrocephalus, which he had cured by puncture and draining off of the fluid.

Velimirovitch[7 No.9] reports a case of congenital hydrocephalus in which, for the rapidly-growing head, puncture was tried and a



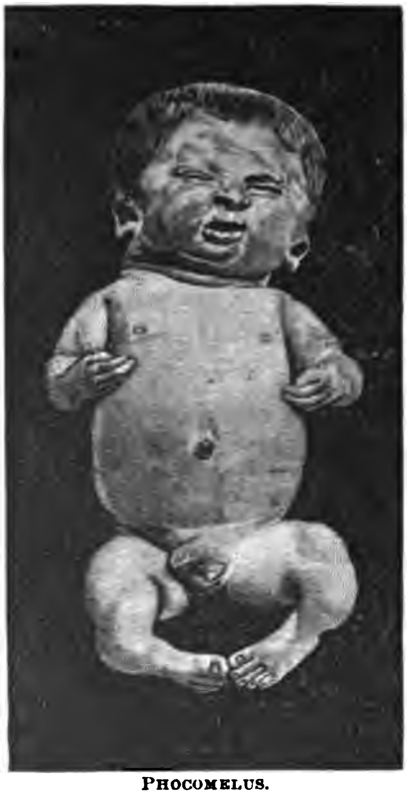
HYDROCEPHALIC MONSTER.
(Journal de Médecine de Paris.)

wineglassful of serum withdrawn. The child died at 10 months. François Hue,[208 June 1] describes a child who died at 20 months of pronounced hydrocephalus.

In the case recorded by Pauthier[24, Feb.] there was quite a collection of deformities. In addition to hydrocephalus there were exophthalmos, complete harelip, and markedly clubbed hands and feet. The mother wanted the doctor to shoot it, and, on his refusal, it was left to die of neglect. (See cut, page 13.)

E. B. Ketcherside[86, Sept.] records a child, still living at 4 months, whose head measures twenty inches in circumference, and destitute of occipital, frontal, and nasal bones. There was also spina bifida of the lower vertebræ.

Encephalocele.—F. W. Whittaker[1, Jan.] reports a case of congenital encephalocele, in which a tumor one inch in diameter protruded through the anterior fontanelle to the height of two inches. The child lived 7 weeks. J. W. Ballantyne's[36, Feb.] case was complicated with spina bifida. The fœtus was born at 7 months, and was the second of its kind from the same mother.



PHOCOMELUS.
(*Chicago Medical Times.*)

Acardia.—A. E. Ross[170, Apr.] delivered an enormously œdematous monster, the upper part of which consisted of a large, rounded eminence, showing, on section, cyst-cavities filled with a clear, straw-colored liquid, and, between the cysts, connective tissue having its interstices filled with fluid. There were present neither thorax, arms, head, liver, spleen, nor pancreas.

Phocomelus.—L. Pike[192, May] describes a case of this rare monstrosity noted in a dead-born child. The arms and legs were about three-fourths of the natural length. Each arm had two elbow-joints and each leg two knee-joints, thus dividing the limbs into three equal portions. (See cut.) A child is recorded by James Collins,[112, July] as being born with arms and legs missing, at knees and elbows, respectively. There was also partial ectopia viscerae.

Kalisko[317 No.8] demonstrated a case of fœtus *in fœtu.* The child lived for 5 weeks, and developed normally, except for the presence of an abdominal tumor. The autopsy showed a cystic tumor, composed mainly of a brownish fluid and two solid masses. One of these had a process having the appearance of a rudimentary fœtal extremity; the other corresponded to a portion of the face.

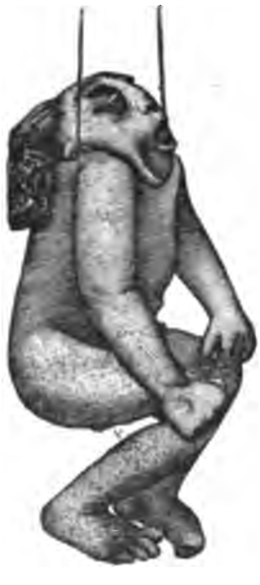
Double Monsters.—M. Baudouin[6 July 18] describes a double monstrosity now going the rounds of the dime-museums. It consists of twin sisters, aged 13 years, united by the posterior wall of the pelvis, just as were Hélène-Judith. The complete pelvis is abnormally large, and is composed of four ossa iliaca, from which spring four well-formed lower extremities. There is but one urethral orifice, though two bladders probably exist, from the fact that they desire to urinate at different times. There is only one clitoris and one vulva, but two vaginæ. There is only one anus also, and the rectum is probably single for some distance, as the desire to defecate is synchronous. Adenot[211 Oct.11] describes an embryonic monster of 2 months, of the sternopagus variety.

Spina Bifida.—J. L. Dickey[161 Apr.] relates the case of a child with spina bifida of the last lumbar and first sacral vertebræ. The membrane had burst during birth and allowed the fluid to escape. The opening became firmly closed, but in six weeks hydrocephalus developed, and a week afterward the child died. A female fœtus, born at the sixth month, and affected with spina bifida and acrania, was shown by Johnston.[282 Feb.]

In connection with the subject of this kind of monstrosities, their time of origin, and their cause, recent researches by von Recklinghausen and Klebs tend to show that the initial error of development was at the time when actual cellular development was beginning in the notochord, and Klebs is inclined to place it even earlier still. Should such prove to be the case, it would follow that maternal impressions, to be effective, must occur about the time the first menstrual period was missed, or, as a rule, before the mother is conscious of being pregnant.

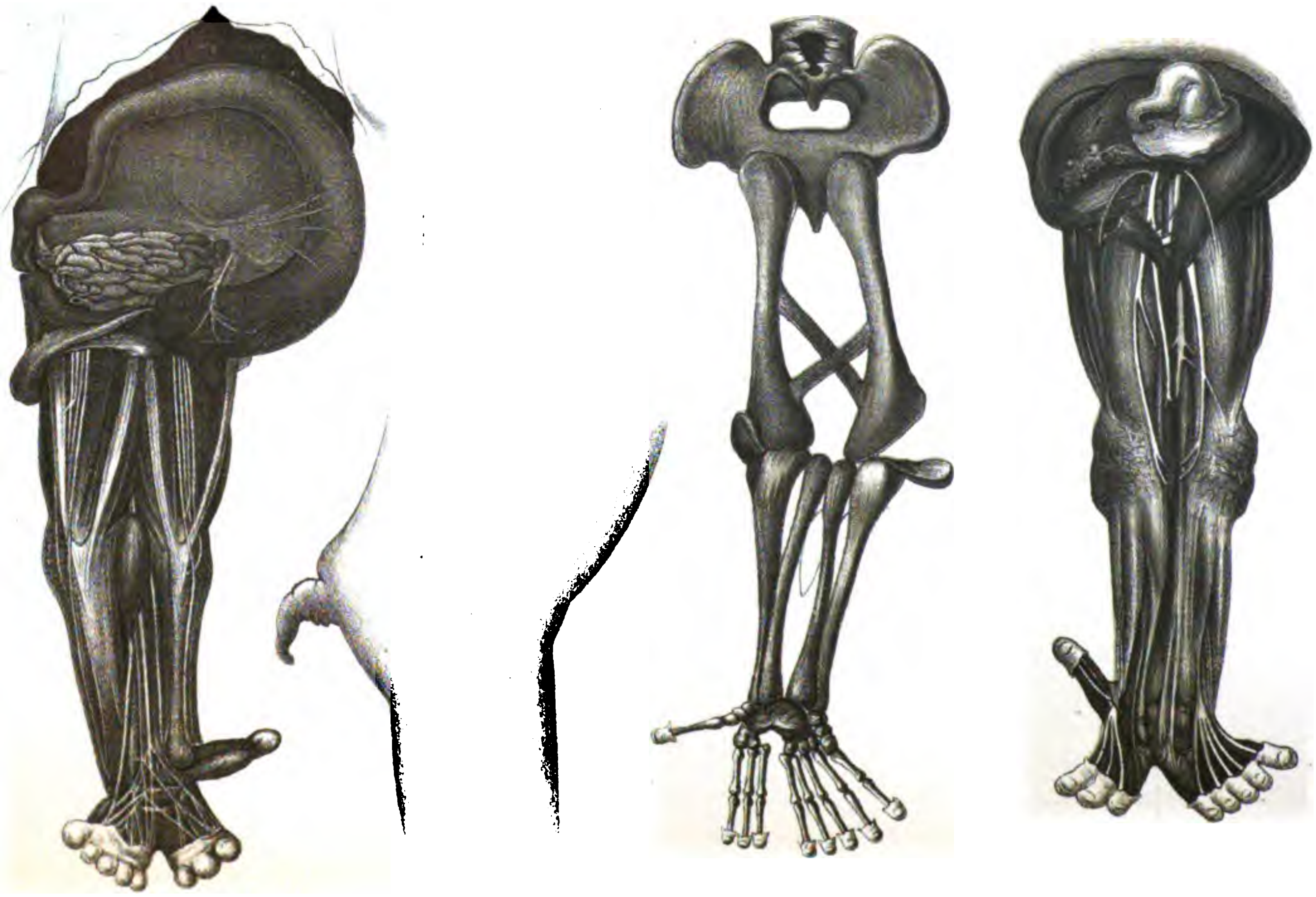
Pepler showed a patient of 15 months, in whom the tumor was cured by the injection of 1 drachm (3.75 grammes) of Morton's fluid. C. A. Graeber[138 Oct.] mentions a case of spina bifida in a very young child, born of a woman aged 57 years, the father being 63 years old. There was also double talipes varus and extremely clubbed hands.

Reynolds[856/My] reports a case illustrated by the accompanying cut. The body is as well developed as could be expected at 8 months (the delivery being premature), with the exception of the skull and brain. The tumor protruding backward is a cystic growth connected with one of the ventricles. Neither of the cerebral hemispheres are developed to any degree, but the medulla oblongata is near the ordinary size. The fœtal heart during the intra-uterine state no doubt pulsated as in other children, and had sent the blood coursing through the arteries and veins. The heart had been governed and caused to move by the gray cells at the floor of the fourth ventricle,—the circulatory centre. While there is nothing specially new in this case, it serves to impress a lesson of importance in physiology with reference to the important subject of cerebral localization. If the heart is caused to move and perform its functions by its own individual cells, we can reasonably conclude that other organs and parts of the body are indebted for their action and work to their own special gray matter.



(*Western Medical and Surgical Reporter.*)

Benington[277/Jan] describes the anatomical peculiarities of a symelic fœtus recently dissected. The general features are well shown in the accompanying plate. A traumatic cause has been assigned, since the mother says that three months before delivery she was kicked in the abdomen.



Dissection of Symelian Monster. (Benington).

Journal of Anatomy and Physiology.

Burk & Mc Fetridge Lith Phila

ANATOMY.

By JAMES K. YOUNG, M.D.,

PHILADELPHIA.

OSTEOLOGY.

The Ophthalmoscope in Osteology.—Louge$^{3}_{\text{Sept.30}}$; $^{2}_{\text{Oct.24}}$ shows that ophthalmic illumination can be applied in anatomy to the study of bone in a dry state, and that it is alike useful for studying the internal structure and for the illumination of small cavities or sinuses. It can also be employed in studying the comparative osteology of small vertebrates, the bones of which are too frail and delicate for section in the ordinary way.

Skull, with Wormian Bones in the Frontal Suture.—Gulliver$^{277}_{\text{Jan}}$ presented before the Anatomical Society of Great Britain and Ireland a specimen of what has been described under the names of Wormian bones, anterior fontanelle bones, and, more recently, as interfrontal bones, by Howes, who, in common with Humphrey and Hyrtl, says they are of rare occurrence. It is interesting to note that the child was the subject of much congenital deformity,—harelip, cleft palate, fissure of the iris, and supernumerary auricles.

A Hitherto Undescribed Canal in the Sphenoid.—Sternberg$^{609}_{\text{p.304,'90}}$ describes a hitherto unnoticed canal in the sphenoid, which he calls canalis cranio-pharyngeus lateralis, best observed in the skull of a child of 3 or 4 years of age. It is to be found at the inner angle of the sphenoidal fissure, immediately at the attachment of the outer root of the lesser wing, whence it passes inward and backward, to open on the under surface of the sphenoid in the fissure under the processus vaginalis. It is autogenetically a direct residue of a fibrous defect in the cartilaginous cranium, and phylogenetically a residue of the fibrous defect in the bony cranium of lizards and of other lower animals.

The Intersigmoid Fossette.—Rogie$^{220}_{\text{May 1,8,22,29,June 19}}$ agrees with Toldt as to the position of the intersigmoid fossette. It is under the mesocolon of the sigmoid flexure, and is bounded posteriorly by the parietal peritoneum; internally by the latter, and in part by a portion of the descending mesocolon; anteriorly, by the posterior face of the descending mesocolon; and externally, by the oblique line from below outward, along which the external zone of the mesocolon adheres to the anterior face of the prerenal peritoneum. The extreme rarity of retroperitoneal hernia developed in this fossette may be explained, when it is borne in mind that with advancing age the latter tends to become obliterated, that it is not constantly present, and that it is but rarely that the mesocolon of the sigmoid flexure leaves its position in the iliac fossa, and thus exposes the orifice of the fossette, which is inaccessible in its normal state.

Origin of the Intermaxillary Bone.—Lannelongue[197 July] has discovered in the Dupuytren Museum the bony skull of an hydrocephalic subject, on which may be manifestly seen the sutures separating four distinct osseous pieces in the intermaxillary bone, as clearly marked as the lines of the cranial sutures. This confirms the view of Albrecht, of Belgium, who described the intermaxillary bone as formed primarily of four segments, and not of two, as is generally admitted.

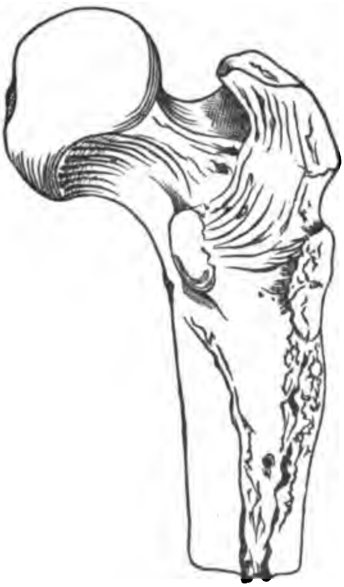
Functions of the Sinus of the Face, the Ethmoidal Cells, and the Cells of the Mastoid.—Couëtoux[37 Mar.] asserts that there is a direct relationship existing between the size of the nostrils and that of the facial sinus. The greater the former, the less developed are the latter. This is clearly exemplified in the negro race. In other words, the function of the sinus is supplementary to that of the nostrils. The ethmoid contributes to the formation of the nasal fossæ, and assists in the diffusion of the inspired air. The humid and overheated air which it contains beats back the odoriferous particles, during snuffling, toward the turbinated bone. The mastoid cells protect the tympanic membrane from the deformative effects of the barometric vacuum, due not so much to the olfactory suction, which is guarded against by contraction of the drum, as to the contraction itself. They preserve the ear from a too lively reaction due to the afflux of air, in addition, but the former function is its main one.

Persistence of the Notochord in the Human Subject.—Musgrove[277 Apr.] discovered in one of the lumbar vertebræ a condition reproducing the characters of the osseous fishes. On making a transverse section through the middle of the body of the fourth lumbar vertebra, there was seen in the centre of the bone a core of unossified tissue, resembling in appearance the tissue of an intervertebral disc. How far this unossified case of tissue can be looked upon as the remains of the notochord it is difficult to say.

Variability in the Level of Attachment of the Lower Limb to the Vertebral Axis in Man.—Birmingham[277 July] considers that 2 specimens of sixth lumbar vertebra, recently examined by him, show clearly that a condition similar to Rosenberg's ancestral type does occur in man, and that this occurrence, which may be considered a reversion to an early type, is a strong argument in favor of the theory which Rosenberg has advanced.

Muscular Insertion on the Femur.—Bellini[7 Jan 15] has found that the external face of the femur is as free from the insertion of muscles as is the internal face.

On the Third Trochanter of Femur.—Koganei[200 Mar 2] has found the third trochanter present in 28.8 per cent. of the Japanese femurs examined, and 26.5 per cent. of the Ainos of Yezo. The size of the third trochanter is said to be very irregular, and to often differ in the same pair; and the author distinguishes three forms,—the small, middle, and large.


THIRD TROCHANTER OF FEMUR.
(Sei-i-Kwai Medical Journal.)

On the Variability of the Upper End of the Fibula.—E. H. Bennett[16 Aug] finds that the head of the fibula varies greatly, and that its articular facette is very variable in size, shape, and position on the upper extremity of the bone; that the facette may be entirely absent; and that the head of the fibula may not extend to the tibial condyle at all.

ARTICULATIONS AND LIGAMÈNTS.

Hyaline Degeneration of the Connective-Tissue Cells.—This degeneration, according to Letulle,[7 Nov 15] is characterized by the formation in the protoplasm of certain cells of the connective tissue of more or less voluminous hyaline globules, colorless or slightly yellowish, tinted by picrocarmine, resisting the action of acids and potash, but intensely colored by Kühne's method of crystal violet. He has found these cells in several instances in tuberculous tissue, notably in lupus, and considers them as presenting a marked analogy to the productions recently described by Russell as the characteristic elements of cancer.

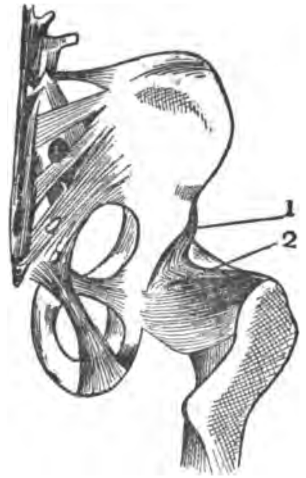
The Coraco-Clavicular Ligaments.—Bellini[7, No. 8] describes four ligaments surrounding this articulation instead of two. These are as follow: (1) the great posterior ligament, or conoid; (2) the small posterior ligament,—the smallest of the four,—situated below the trapezoid, and of a triangular form, rising from the posterior border of the coracoid process and inserted on the clavicle slightly behind the trapezoid, with which it mingles; (3) the trapezoid ligament; (4) the intermediary ligament,—a quadrilateral ligament attached to the omoplate of the clavicle and the upper face of the coracoid process.

Bilateral and Symmetrical Bronchial Cartilages.—Poirier and Retterer[165, Jan., Feb.] report the occurrence, in the cadaver of a woman 40 years of age, of the formation of two cartilaginous nodules—bilateral and symmetrical—upon the neck. These growths were situated upon the anterior border of the sterno-cleido-mastoideus, at the level of the crico-thyroid membrane, and formed nipple-like projections about eight to ten millimetres in height. They were firm and resisting to the touch, but were somewhat movable at the summit, and their bases appeared to extend deeply under the anterior border of the sterno-cleido-mastoid muscle toward the pharynx, and to unite with a fibrous cord, which could be readily felt. Dissection showed that the larynx and pharynx were in a normal condition.

Structure of Elastic Cartilage.—Pilliet[7, No. 17] finds that, in the cartilage of the alæ of the nose, instead of the usual net-work of elastic fibres surrounding the cells, the elastic substance appears to be combined with the fundamental substance of the cartilage in such a manner as to constitute a homogeneous whole. In the cartilage of the ear the elastic substance disappears at points, and vessels emanating from the perichondrium penetrate into it. The elastic fibres are the first element involved in degenerative processes.

Note on the Radio-Carpal Articulation.—Francis J. Shepherd[277 Ap.] concludes that perforation of the meniscus is rarely normal; in nearly every instance he has found it due to some pathological condition, caused either by injury to or disease of the lower radiocarpal articulation.

An Undescribed Ligament of the Hip. — M. Bellini, of Athens,[7 May; 2 Sep., July 26] describes what he supposes to be an undescribed ligament of the hip, to which he gives the name "tendino-trochanterian." This consists of a band of fibrous tissue, which arises above at the lower border of the reflected tendon of the rectus femoris, and runs downward and forward toward the internal anterior border of the great trochanter, below and a little in front of the tendon of the gluteus minimus, with which it has a tendency to blend.



1, Reflected tendon of rectus; 2, "tendino-trochanterian" ligament of Bellini.
(*Bulletin de la Société Anatomique.*)

The structure is an interesting one, and the ligaments of the hip-joint have, or ought to have, a special interest in the eyes of surgeons. On these accounts, John Cleland[2 Aug. 29] calls attention to two points in this connection, namely, that the structure in question has been noted for over twenty-five years in one of the principal anatomical text-books in the English language, and that it is there justly appreciated as not a ligament, but as part of the insertion of the gluteus minimus muscle. Henry Morris[2 Sept. 12] has also called attention to the error of Bellini, and quotes his own description.[2022 79] In referring to the article of Cleland, Morris is not quite satisfied that Bellini and Cleland are referring to the same structure, but believes that there is a much closer connection between the "new ligament" and the capsule than between it and the gluteus minimus tendon. After perusing Bland Sutton's ingenious and suggestive articles "On the Nature of the Ligaments," Morris is inclined to think it very probable that the ligamentous bands, both in their relation to the gluteus minimus and to the reflected tendon of the rectus, are the fibrous representatives of the gluteus quartus (musculus scansorius). While this undescribed ligament cannot be considered as a discovery, it is only right to acknowledge the part taken by Bellini in its christening.

The Pectineus Muscle and its Nerve-Supply.—Paterson[277 Oct.] states that the chief points of interest attaching to the pectineus is the fact that it may be innervated by two morphologically distinct nerves,—the anterior crural and obturator; and also from a third source,—the so-called accessory obturator nerve. From a study of the relation of the nerve-supply, he concludes that the term "accessory obturator" is a misnomer, and that the name *accessory anterior crural* would be a more correct designation, on the ground that the nerve is really a detached portion of the anterior crural nerve.

The Muscular Mechanism of Walking.—W. Ramsey Smith[277 July] believes that in propelling the body forward, as in ordinary running and walking, the tibia is prevented from rotating on the femur, and is flexed on the femur by certain muscles acting in pairs, while the flexors inserted into the inner aspect of the tibia, considered as a whole, act in concert with the great extensor and the external rotators of the femur in extending the hip-joint and in flexing the knee, and in preventing rotation of the knee as a whole. Again, it is believed that it is possible that the knee may be fully extended and locked just at the moment when the limb is leaving the ground to take the pendulum-swing forward, or the joint may be locked just when the advancing foot has touched the ground.

Anatomy of the Human Heart.—Meigs,[5 June] concludes that the observation of the presence of spaces in the fibres of normal human heart-muscle is likely to prove of much importance if the explanation that they are capillaries is correct. The fact that endothelial nuclei can be seen at the edges of such spaces in almost all properly prepared sections, and that occasionally even the whole circle of the endothelial wall is visible, would seem almost conclusive evidence of the correctness of this explanation.

Anatomical Relations of the Cerebral Arteries.—Tedeschi,[75 Mar.1,'90; 242 Aug.] from numerous comparative injection experiments, concludes that the arteries of the cortex of the brain are not terminal; that the cortical arteries of the cerebrum and cerebellum anastomose; that the arteries of the base and cortex of the brain communicate; that the arteries of the two hemispheres, both in the base and cortex, communicate; and that the arteries communicate with the veins not only by means of the capillaries, but also directly.

On the Veins of the Capsula Adiposa Renum.—Tuffier and Lejars[410, p. 41; 25, May] describe the venous system of the capsula adiposa as formed by trunks, with transverse branches of communication, which pass anteriorly, by two or three channels, into the renal vein or the veno-azygo-lumbar vessels; or, finally, into the veins of the ureter, and posteriorly into the retropelvic plexus, which is formed by the superior termination of the veins of the ureter.

THE VASCULAR SYSTEM.

The Position of the Arteries of the Limbs.—Bouchard[7, Apr. 30] says that in the embryo the position of the vessels is determined by the tendency of the circulation to flow in the plane of the least resistance. This will, necessarily, be in the plane of flexion, the position where the vessels are found, and will explain the spiral course of the latter. If any obstacle exists in the plane of flexion, the newly-forming vessels extend around it, and in this way may be explained the formation of anomalous vessels. On this same principle of flexion offering the least resisting channel for the flow of blood, Bouchard explains the superior development in man of the anterior brain over the posterior.

Veins of the Hand.—Thibaudet,[220, July 31] describes a true superficial venous sheath which entirely surrounds the fingers, composed of a dorsal and a palmar face, and two lateral faces, composed of oblique anastomoses uniting the other two. There is also an extraordinarily rich subcutaneous palmar net-work supplying the entire palm of the hand. By means of a plexus an anastomosis is established between the deep veins of the hand and those of the forearm. Two very important anastomoses are noted: one unites the end of the deep venous arcade to the cephalic of the thumb, the other to the *salvatelle* of the little finger.

THE ALIMENTARY APPARATUS.

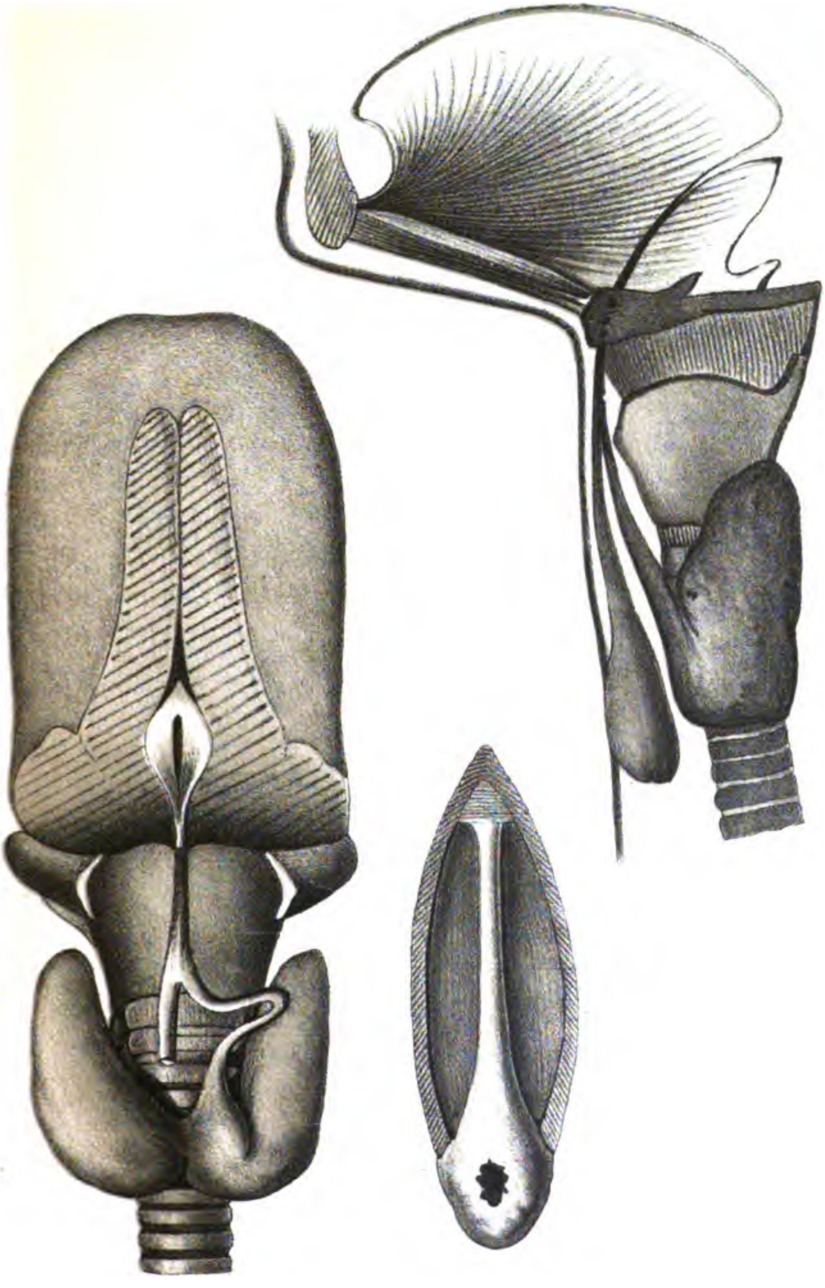
The Angles of the Tooth-Sockets.—Boenning[121, Aug.] has made some (50) original observations upon this subject, which would seem to prove the proposition that the angle of the socket increases in passing from the anterior teeth to the molars.

Relations of the Dentary Arcades in the Crania of Australian Aborigines.—Sir Wm. Turner,[277, July] after an exhaustive research upon the want of overlapping of the lower jaw by the upper in the incisor region, concludes that it is not due to a forward growth of the mandible or its contained teeth, to an extent proportionately greater than that of the upper jaw, but that it is, in all probability, occasioned by a modification in the construction of the skull itself, which affects the relation of the face to the cranium proper.

The longer base-line, when occurring along with an arch of shorter dimensions, is associated with a modification in the cranio-facial curvature; it affects the relation of the face to the cranium, and influences, he believes, the position of the upper jaw. With the shortening of the base-line, the more horizontal directions of the ethmoids, cribriform plates, and the greater development of the curve of the cranial vault, especially in the frontal region, the upper part of the face lies more immediately below the forehead, the longitudinal axis of the superior maxillæ approaches in direction to the vertical, the prognathous character of the upper jaw is diminished, the lower jaw slightly recedes, and the lower dentary arcade becomes included so far within the upper that the upper incisors overlap the lower.

Anatomy of the Intestinal Villosities.—Chaput[7, No. 4] says that the disposition of the intestinal villi is different from that which is generally admitted. A longitudinal and transverse section shows that the mucosa of the dog is formed of a multitude of prisms or truncated pyramids, placed side by side, leaving a sufficient space between them for the passage of the intestinal mucus. He says that the shapes of the filiform villi given by the older writers are due to the fact that the sections were not made strictly parallel to the axis of each villus.

Anatomy of the Liver.—Debove[17, Apr.] notes that in disease the color of the liver varies greatly. In congestion and poisoning by carbonic acid it becomes a deeper red; in fatty degeneration it changes to yellow; in melanotic cancer it is black, and also in the melanæmia following grave intermittent fever. Its consistency increases in cirrhosis, and diminishes in hepatitis, acute yellow atrophy, and most of the infectious diseases. The weight of the liver increases in hypertrophic cirrhosis, fatty liver, and cancer; it diminishes in acute yellow atrophy, and especially in atrophic cirrhosis.



Thyro-Glossal Duct. (Marshall).

Burk & McFetridge, Lith Phila.

Thyro-Glossal Duct or Canal of His.—C. F. Marshall[277 Oct.] records an autopsy on a child in which there was a so-called persistent canal of His. In the absence of evidence to show whether a pyramid to the thyroid gland is always present in these cases it is impossible to come to a definite conclusion, but he thinks that the facts shown by his specimen favor the view that the so-called canal of His is a remnant of the middle thyroid rudiment of His. It is not difficult to imagine that this may gradually become dilated at its lower end into a sac, by the secretion of mucus from the wall of the canal, and that this sac ultimately causes the skin to give way, by its pressure, till a sinus is formed. If this explanation is correct, it is easy to see that a persistent thyro-glossal duct may be due to the persistence of either of the two lobes formed by the bifurcation of the median thyroid rudiment. Kanthack[277 Jan.] undertook the investigation of the development of the thyro-glossal duct, with a view to ascertaining the frequency and history of the lingual duct. The tongues of more than 100 adults and 60 fœtuses, varying from two and a half to eight months, were used. According to these investigations, "in 100 adults a ductus lingualis has never been found, in many cases not even a foramen cæcum. Whenever the latter was prolonged backward any distance it ran as a blind canal near the surface. A tubular lumen in the lobus pyramidalis was not observed." As the results of the examinations of fœtal and infantile tongues (*a*) it was proved beyond all doubt that a cornu medium and a foramen cæcum need not and do not go hand in hand; (*b*) again, a tubular lumen was never found in the lobus pyramidalis, which always consisted of muscular or thyroid-gland tissue; (*c*) the foramen cæcum was absent or exceedingly small in a great number of cases. The longest canal measured five millimetres (in a newborn child), and ran close below the surface. In no case could the canal be traced to the hyoid bone, though in all these cases the microscope was employed.

In regard to the origin of the foramen cæcum, he is convinced that, though the foramen cæcum and the thyroid duct are both derived from the pharynx, they are quite distinct one from the other, and when a tumor composed of thyroid tissue is actually found in the base of the tongue he should hesitate to trace its origin to the so-called lingual duct. Most of the cases of tumor in the base of the tongue described as tubular glandular adenomata are believed, therefore, to be derived from the mucous glands situated there, and. that, if thyroid-gland tissue should be found, it is developed from the glandulæ hyoideæ, and has nothing to do with the foramen and its blind *cul-de-sac*-like prolongation. "Persistent lingual ducts" he considers to be due (*a*) to a deficient closure of the sinus cervicalis of Rabl and His; (*b*) to a persistence of the second inner bronchial groove, which has torn through into the sinus cervicalis.

THE RESPIRATORY SYSTEM.

The Epithelium and Glands of the Larynx.—Heymann$^{20}_{\text{B.118,p.[illegible]}}$ found, at the upper border of the laryngeal cavity, a complete fringe of pigment-cells, which is in direct connection with the pavement epithelium of the mouth and pharynx. Basement epithelium covers also the whole interarytenoid space. In connection with the latter lining, there is also always a small strip of pavement cells at the free border of the true vocal cords; frequently, also, at the free border of the false vocal cords. Upon the posterior surface of the epiglottis and upon the membrana quadrangularis there is, close to the upper border of the basement epithelium, a district where the ciliated cylindrical epithelium is interrupted by numerous islands of basement epithelium. In all other places there is ciliated epithelium, which only incloses, here and there, little islands of basement epithelium.

The very numerous acinous glands all seem to be mucous glands. Some can also be found at the border of the true vocal cords, above the point of the processus vocalis.

The Suspensory Apparatus of the Pleura.—Sébileau$^{7}_{\text{No.17}}$ has been unable to find the cervico-thoracic diaphragm described by Deville, Degrusse, Bourgery, and Jacob, and concludes that it does not exist. In the course of his study, however, he has discovered, at the upper portion of the thorax and the base of the neck, in the subclavicular fossa, a suspensory apparatus of the pleura, which he describes, and which he says has been mistaken by the authors quoted for a diaphragm. This suspensory apparatus is formed of two layers, which run together more or less at their antero-inferior extremity, but which are entirely distinct at their postero-superior extremity: the one is superficial, superior, and internal; the other, deep, inferior, and external. It exists in the form of white, nacreous fibres at the summit of the pleural cone, arising from small tendinous tongues on the vertebral column and the posterior segment of the last costal arc. These fibres spread out over the anterior portion of the pleural cap in a fan shape, fixing themselves firmly upon the connective frame-work of the serous membrane, and finally attaching themselves to the anterior segment of the first rib. The superficial layer may be ligamentous or muscular, more usually the former, as is also the case with the deep layer, a direct proportion existing between the two. The object of this suspensory apparatus is to maintain constantly the pleural dome in an elevated, fixed, and immovable position.

The Medial Borders of the Lung.—Krönig[34, Apr. 28] found, through percussion, in 400 persons, that the right border of the part of the normal heart which is not covered by the lungs does not run along the left sternal border, but that it commences at the diaphragm in the middle of the sternum, and, running obliquely upward toward the outside, ends about 1.5 centimetres laterally from the left sternal border above the fifth rib. The left border runs from here to the apex impulse.

THE GENITO-URINARY APPARATUS.

Bladder and Urethra.—Griffith[277, July] found that the muscular fibres of the walls of the bladder are collected into broad bands, two of which, from one to two inches in width, have an external longitudinal direction from the apex to the neck in the middle of the anterior and posterior surfaces. The other bands, which form the greater part of the wall, have an oblique or transverse direction, crossing over and under one another. They deny the existence of an internal sphincter, and state that the striped muscle around the genital part of the urethra is developed especially in relation to the sexual function.

Mucous Membrane of the Uterus.—Boldt[23, Nov.,'90] describes rod- and spindle- shaped nuclei of smooth, muscular fibres surrounding the utricular glands. In the cervix uteri of the virgin the glands are tubular, irregular in outline, small in calibre, and covered with a single layer of columnar epithelium. In a multipara the gland-ducts are wider and more branching than in the virgin, and between the basal and the boundary layers there is a layer of smooth, muscular fibres, two or more muscle-spindles of which surround each gland.

Origin of the Vagina.—Retterer,[927, p. 391] as stated by Windle,[32, Oct.] is led, by his observations, to modify the classical opinion as to the development of the vagina at the expense of the fused inferior extremities of the Müllerian ducts. According to his view, during the third and fourth months the uro-genital sinus divides, starting from the place of entrance of the Müllerian ducts, by the formation of two lateral folds, whose gradual fusion from above downward forms the urethro-vaginal septum. This septum prolongs itself during the fifth and sixth months to the inferior part of the bulb of the vagina, which explains the descent of the vagina and of the urethra at this date, which had previously been observed, but not explained. The superior portion of the vagina, which corresponds to the base of the bladder and to the superior segment of the urethra, which is surrounded by a complete striated sphincter, is alone derived from the Müllerian ducts. The inferior portion, which corresponds to that segment of the urethra whose sphincter is interrupted posteriorly, is derived from the uro-genital sinus.

Ureters.—Poirier[8, July] has injected a large number of ureters, and has observed two very interesting facts: (1) that it is not very rare to find a double ureter, 8 instances being noted in 220 injections; (2) that the liquid injected into the ureters penetrates into the renal vein. He is unable to say whether this penetration is the result of a rupture, or whether it should be regarded as a physiological phenomenon. In any case, it demands great caution on the part of the surgeons who are accustomed to practice injections into the ureteral canals.

BRAIN AND NERVES.

Surface Anatomy of the Brain.—Moritz Benedikt[277, Jan.] develops the results of his studies upon this matter, which are, in some important points, opposed to the generally adopted views. In his studies of the fissures and convolutions of primates and other gyrencephalic animals, he has examined not only the external shape, but he has also made a great number of sections of brains of all classes and inspected the relations to the central ganglia, the nature of the microscopical elements in the neighborhood of fissures, and the results of vivisectional experiments and pathological facts, with the view to estimating the true value of fissures, convolutions, and lobes. The first impressions of the study of sections, in which the central ganglia and their relations to the cortex were the principal guides, was this: that the assumed great difference in the construction of brain and in the distribution of parts has no existence in reality, but is only produced by the different delineations of fissures which exist in different classes of animals. A general principle of nature is also the following: that, when in a certain part of the brain the one or other fissure is well developed, the others are reduced, or even disappear.

Fissure of Rolando.—Cunningham$^{277}_{\text{Oct.,'90}}$ furnishes an interesting and valuable account of the fissure of Rolando in man and the lower animals. According to this description, it appears to be developed in two separate and distinct portions, the most usual time being the last week or ten days of the fifth month, but it is not uncommon to meet with hemispheres well on in the sixth month with no sign of the fissure. In 1 case the appearance led him to believe that this fissure might have been developed in the manner usually attributed to it, which course of development in certain cases he does not deny. In an analysis of fifty-two hemispheres, the distance reached by the fissure upon the upper border of the hemisphere is carefully estimated. The growth of the two bounding banks of the fissure is also found to vary, the growth in the posterior central convolution being greater.

The position of the fissure on the surface of the brain, in all probability, becomes fixed at the third month of extra-uterine life. Its relations to the coronal suture vary greatly early in life, but the suture assumes a fixed position at the fourth or fifth year of childhood. With reference to the fissure of Rolando, according to Cunningham's deductions, at no period of growth does the position of the fissure exhibit what might be safely regarded as sexual differences.

Origin of the Cerebral Convolutions.—Schnopfhagen$^{890}_{\text{v.9,p.197}}$; $^{277}_{\text{July}}$ has endeavored to show (in opposition to the view usually held that the conformation of the brain is due to the influence of the enveloping skull-cap) that it derives its form from the growth of the tissue between the cortex and the basal ganglia. His views are thus summarized: "The growth of the projection fibres raises the cortical region in the direction in which they irradiate from the ganglia of the base, and so form those prominent strands which go by the name of convolutions. This fibre-system further indicates the greatest amount of growing energy of the brain-mantle, because it can only elongate on one side, and that is toward the cortex. The sulci arise along the lines of least growth energy,—that is, where the division-points of the association fibres range together in lines. The extensive sphere of the furrow-walls affords the different long association fibres sufficient play-room to assist in the building up of the convolutions."

Development of the Gyri and Sulci of Insula.—Cunningham[277, Apr.] gives the following brief account of the condition of the insula in those fœtal brains which he specially examined with the view of determining the development of the gyri and sulci: In the latter weeks of intra-uterine life the development of the gyri and sulci on the surface of the insula takes place very rapidly; consequently, at birth, the insula presents very nearly the same convolution pattern that it does in later life. All the details are filled in. Further, the præcentral furrow, instead of having fallen back, as Guldberg supposed, to form the sulcus centralis, has in reality moved very slightly forward, so that it does not lie so accurately in line with the corresponding furrow on the mantle as it did on its first appearance. This is brought about by the formation of that triangular depression which marks off the gyrus brevis secundus from the gyrus centralis anterior (gyrus brevis tertius).

The Sylvian Fissure and the Island of Reil in the Primate Brain.—Cunningham[277, Jan.] states briefly some of the results obtained in connection with a somewhat prolonged investigation into the anatomy of the Sylvian fissure and the island of Reil in the primate brain. In his description of the anterior limbs of the Sylvian fissure he agrees with Eberstaller, viz., that the incision through the operculum should be so complete that it should reach the furrow surrounding the island of Reil. If the "anterior limb," so called, of the Sylvian fissure in the anthropoid brain is to be regarded as homologous with anything, it must be with the ascending limb of the human brain, and for this reason "*the part of the island of Reil which corresponds to the frontal operculum or pars triangularis in man is absent in the anthropoid ape.*" Another striking difference between the human cerebrum and the anthropoid cerebrum is to be found in the relative size and in the position of the island of Reil. Some interesting and topographical relations are recorded. It is well known that the posterior horizontal limb of the Sylvian fissure in the last month of intra-uterine development, in the newborn infant and in the young child, lies considerably above the level of the squamous suture, but the relative position which it occupies with reference to this suture at different periods of life has not hitherto been made out. This difference in the position of the Sylvian fissure with reference to the squamous suture at different periods of growth is not, as has been supposed, due to the infero-lateral border of the hemisphere becoming more elevated at the expense of the outer surface of the temporal lobes. Throughout all periods of growth the same sulci and the same convolutions of the temporal lobe lie between the Sylvian fissure above and the infero-lateral border of the hemisphere below. In the first stages of the covering in of the Sylvian fossa the temporal operculum is much more energetic in its growth than the parieto-frontal operculum, which grows down to meet it. Before long, however, the tables are turned, and the parieto-frontal takes the more prominent share in the inclosing of the insula; and there cannot be a doubt but that it is this excess of growth energy, carried on through infancy and early childhood, which leads to the depression of the Sylvian fissure. Little difference between the relative length of the Sylvian fissure in the male and female was observed, and what difference was found seems to be in favor of the male. In the adult the average Sylvian angle—the angle formed by the posterior horizontal limb of the fissure with a line drawn at right angles to the longest antero-posterior diameter of the hemisphere—is 67.8 degrees, and there appears to be little or no difference in this respect between the male and the female. In the left hemisphere, however, the angle (70.4 degrees) is more open than on the right side (66.3 degrees), and this is a difference which exists at all periods of life. In children and infants the angle is more acute. In full-time fœtuses it was found to be 62.1 degrees. Unlike the Rolandic angle, the Sylvian angle does not appear to be affected by the form of the head.

A Large Human Brain.—Wilson [36, Jan.] records a brain weighing 64 ounces (1920 grammes), removed from a man aged 75, 5 feet 10 inches in height, and weighing 12 stone 4 pounds. The brain is described as "large vertically" and "well shaped all over," with "convolutions, if anything, larger than normal," and "sulci wide over vertex, except occipital."

Law of the Position of the Nervous Centres.—Julien $^{3}_{\text{Apr. 3}}$ has formulated a general biological law, as follows: "There is a constant relationship between the position of the principal nervous centres and that of the principal sensory and locomotive organs." These nervous centres, as shown in the various classes of animal life, may be reduced to three distinct types,—ventral, dorso-ventral, and dorsal.

Connections of the Cerebellum.—Brosset $^{17}_{\text{July 22}}$ concludes that the cerebellum is joined to the isthmus of the encephalon by a vast commissure, which places it in communication with the cerebro-medullary fibres,—centrifugal and centripetal. The connection is established between the cerebellar and the pyramidal fasciculi through the medium of small cells disseminated through their intrications. A communication also exists between the cerebellar fibres and the olivary bodies.

Structure of the Cortex of the Brain and Cerebellum.—Targowla $^{7}_{\text{Mar. 13}}$ finds that the centres which preside over the movements of the members and the paracentral lobule which is formed by the union of the two ascending convolutions are the richest in intra-cortical fibres. In the regions situated anteriorly and posteriorly to these centres the intra-cortical fibres are less numerous. In the cerebellum the fasciculi of the white substance ramify in the cortex in a fan-shape, and penetrate even to the clear space, in which are lodged the cells of Purkinge, where they form a circular plexus. Contrary to that which is seen in the cerebral cortex, the granular submeningeal layer of the cerebellum is completely free from nervous fibres.

Central Nervous Apparatus of Olfaction.—Trolard $^{94}_{\text{Nov., '90; Mar., July}}$ divides this apparatus into the following portions: 1. The *olfactory chiasm*, which occupies the anterior perforated space, and toward which converge the three arcs—the rachidian, the intermediary, and the cerebral—of the sensory-motor nervous system of the nose, and in which is the apparent origin of the olfactory nerves. 2. The *cortical centre of olfaction*, which is situated in the oval body. The gray lamella of the pes hippocampi unites with that of the cornu ammonis in such a manner as to form a concave groove, which is occupied by a mass of gray substance of a deep tint, of which one portion, passing between the adjoining body and the corresponding face of the pes, forms a free band, more or less studded,—the oval body. 3. The *connections of the olfactory chiasm with the medulla* (*the rachidian arc*). These consist in some fasciculi, which appear upon the inferior face of the cerebral crura, and which are very probably an emanation from the principal fasciculus, together with the principal fasciculus itself, which, taking its origin in the floor of the fourth ventricle, forms, with its congener of the opposite side, the posterior perforated space, and puts itself in relation with the mammillary tubercle. 4. The *connections of the olfactory chiasm with the optic thalamus* (*the intermediary arc*). The chiasm is joined to the anterior tubercle of the optic thalamus by the perioptic riband and by the opto-striate band, which also extends to the septum lucidum. 5. The *connections between the optic thalamus and the cerebral cortex* (*the cerebral arc*). Communication is established between the anterior tubercle of the thalamus and the cerebral cortex by means of the columns of the trigone. The author concludes that the septum lucidum is to the olfactory chiasm what the gray origin of the optic nerves is to the optic chiasm. 6. The *connections between the olfactory chiasm and the cerebral cortex* (*the direct arc*),—constituted by a continuation of the base of the diagonal band and the external olfactory root with the reticulated white layer of the lobule of the hippocampus, the nerves of Lancisi, and the anterior columns of the trigone.

Some Varieties of the Last Dorsal and First Lumbar Nerve.—Montagu Griffin, $^{277}_{Oct.}$ in investigating this subject, obtained results which are opposed to the statements made on this subject by Ellis, and supported by the German investigators,—Krause, Aeby, and Schwalbe.

Innervation of the Thenar Eminence.—Lejars$^{2}_{Sup.,Jan.24}$ gives an account of the nerve-supply of the thenar eminence. After remarking upon the anomalies of nerve-supply disclosed by accidental division of nerves, and especially that after section of the median the thenar eminence retains its sensibility and the thumb retains its power of abduction, he quotes the current accounts of the nerve-supply, and concludes that the muscles of the eminence are supplied both by the median and by the radial.

Nerve-Supply of the Intestines.—Eskridge $^{6}_{Oct.31}$ has recorded a case which he believes illustrates the nerve-supply of the intestines in the region of the ileo-cæcal valve. Fracture and dislocation of the twelfth dorsal vertebra, great distension of the lower part of the ileum and upper part of the colon was found, associated with inflammation and disorganization of the twelfth thoracic ganglion of the sympathetic. This condition of the ganglion he regards as the cause of the distended bowel.

Nerve-Endings of the Labia Minora and Clitoris.—J. C. Webster[2027, v.3] discusses the differences in the recorded results of the observations of Carrard, Ballantyne, Krause, Schweigger-Seidel, Kölliker, Klein, and Frey, on the nature of the nerve-endings to be found in the labia minora and clitoris, and gives his own conclusions formed from the study of a large series of the thinnest sections cut in paraffin and differentially stained. In the labia minora he found a few (*a*) Pacini's or Vater's corpuscles, both in single and compound forms; (*b*) Krause's end-bulbs, which are the most numerous; and (*c*) a few Wagner's and Meissner's touch-corpuscles. In the clitoris he demonstrated (*a*) Meissner's corpuscles, few in number; (*b*) end-bulbs; (*c*) a few Pacini's corpuscles; and (*d*) Krause's genital corpuscles.

It has been proved beyond doubt that the labia minora are skin and not mucous membrane, and Webster has found sweat-glands present.

The Motor Tracts of the Spinal Cord.—Rossolimo,[94, July, Sept.] from his researches upon the direction of the fibres of the posterior roots in the interior of the spinal marrow, concludes that, when in an animal submitted to a hemisection of the spinal cord, the voluntary movements of the paralyzed extremity return to their primitive state. This result is produced always by a substitution of the nervous tracts destroyed by the operation by other tracts situated on the opposite intact side of the spinal cord throughout its entire length, from above downward. That is to say, from the intersection of the pyramids to the level of the motor roots containing the nervous fibres for the posterior extremity, where they pass immediately from the side of the lesion.

Macular Fascia of the Optic Nerve.—Guépin[164, Sept. 17] says the optic tract appears to be formed of two fasciæ, which constitute in their entirety a vast commissure joining the retina to the corpora *genouillés*. Of these two fasciæ, one is voluminous, and is the principal one; the other is delicate, and supplies the yellow spot. This is the macular fascia. It does not seem to have a distinct centre in the brain, and is represented in the optic tract by two small, scattered bundles of fibres. These fibres are so distributed as to supply each macula lutea, which are thus placed under the influence of the two cerebral hemispheres. The destruction of one of the bundles will act upon the two maculæ, producing a hemianopsia, the line of scotoma passing directly through the centre of each of the yellow spots. Certain dyscrasiæ, such as the diabetic, seem to prefer particularly the macular fascia.

Munk's Visual Centre.—Ratimoff$^{859}_{\text{Feb.7,'90}}$ gives the history of a case of gunshot wound of the head which he thinks supports Munk's ideas as to the locality of the visual centre. None of the senses but that of vision were impaired, and at the necropsy there was an abscess at the site of each centre, and the left one contained the bullet.

Nerves of the Cornea.—A. C. Dogel$^{6}_{\text{July 26}}$ examined eyes which had been taken from the body from five to seventeen hours after death. He found the cornea provided with from 60 to 80 small nerve-branches, some with and some without medulla, of which from 20 to 30 go to the posterior corneal surface and from 40 to 50 to the anterior. In these nerves a central filament and a peripheral axis-cylinder substance may be distinguished. The central filament resolves itself into single nerve-fibrillæ. Within the corneal parenchyma the nerves and their branches form a primary plexus. This primary plexus gives out secondary branches, called "rami perforantes," which form the subepithelial plexus, and this again gives rise to still finer ramifications forming an intra-epithelial plexus. The same nerve-branch generally shares with its branches of the second order in the formation of all these plexuses. The nerve-terminations in the epithelium are bulb-shaped, and form ganglions. An especial thickness and zigzag course distinguish those filaments which go to the stroma of the cornea. These also form a plexus. Each layer of the cornea has a separate plexus, except the membrane of Descemet and the next layer, which have no nerve-plexus. The author believes, in opposition to Kühne and Waldeyer, that the nerves of the cornea have no sort of connection with its cells and corpuscles, but are merely situated between them.

Structure of the Zonula and Neighboring Parts.—Topolanski[204 V.37,p.25,61; 90 July] describes the zonula as not a membrane, but as a meshwork of fibres arising from the ciliary region to be inserted in the lens capsule. The most posterior fibres have their origin from the vitreous membrane of the pars ciliaris retinæ,—not in a regular circle, but in a zigzag line,—and fibres arise from all the surface in front of this excepting the anterior ends of the ciliary processes, from which no fibres whatever arise. The sides of the ciliary elevations and the valleys between give origin to a large number of fibres, while the crests themselves supply very few. The insertion of the fibres into the lens capsule is in three divisions,—one in the front surface of lens, one at the equator, and the third in the posterior surface.

Nervous Plexuses of the Iris.—Boucheron[25 Mar.] describes three chief plexuses in the iris: one, of an annular arrangement, near the periphery, which is common to the iris and ciliary bodies; a second, in the central part, arranged in arches; and one near the pupil, in the region of the sphincter.

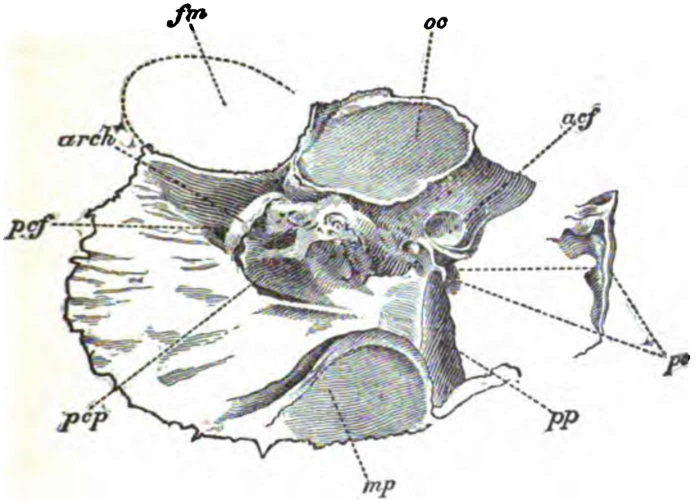
The Uveal Gland.—Nicati, of Marseilles,[6 Mar.21] contributes an important addition to our knowledge of the structure of the ciliary region of the eye in the discovery of a glandular apparatus by which the aqueous humor is secreted, which he styles the "uveal gland," or gland of the ciliary processes.

Skin and Scalp of the Negro Fœtus.—Thomson,[277 Jan.] as the result of certain investigations undertaken by him to disprove the statement of Camper, Hunter, and Waitz that the negro fœtus was born white, and that the action of light and air was one of the factors necessary to the production of color, suggests that the deposition of pigment about the lower part of the hair-bulb is in some way associated with increased activity in the development of the hair. The bulb of the hair is seen to be enveloped in a pocket of interlacing pigmented matter. This appearance is due to the presence of pigment *between* the large cells which surround the papilla, cells which, on the one hand, are continuous with the cells of the rete mucosum of the outer root-sheath; on the other, with those which, advancing forward on the surface of the papilla, became modified to form the hair. As these cells of the hair-bulb are traced forward on the papilla, the pigment which appears *between* the lower cells (*inter-cellular*) becomes, in the older cells, absorbed in a granular form *within* the cells (*intra-cellular*).

REGIONAL ANATOMY.

Craniometry of Some of the Outcast Tribes of the Punjab.—R. Havelock Charles [277 Oct.] has made interesting observations upon 50 skulls belonging to Chúhra and Chamár, outcast tribes of the Punjab, who are considered to be almost certainly aborigines. These include not only certain points of interest observed as regards the condition of the sutures,—glabella, inion, and jugular foramen,—but also the post-condyloid foramina, parietal foramina, the size of the plexion, and the paroccipital process.

Anatomy of the Mastoid Region.—Birmingham [2 Jan. 24] read a paper before the Royal Academy of Medicine in Ireland upon this subject, with guides for operating. He referred to the great variability of the course of the lateral sinus, showing that it might wander up or down, to the extent of an inch, some distance behind the ear. A method of mapping out the limits within which it might vary is carefully given.



Anatomy of Suboccipital Region.

fm, **foramen magnum;** ***oc***, **occipital condyle;** ***acf*** **and** ***pcf***, **anterior and posterior condyloid foramina;** ***pcp***, **paracondyloid process;** ***m***, **mastoid process;** ***pp***, **paroccipital process;** ***pc***, **parajugular canal;** ***arch***, **bony arch.**

(*Journal of Anatomy and Physiology.*)

Some Points in the Anatomy of the Suboccipital Region.—Grünbaum [277 Apr.] describes the so-called "paracondylar process" and the "parajugular canal," together with certain soft parts corresponding. In 250 skulls examined the paracondylar process was found to vary, four different classes being distinguished: (1) process and bony arch complete or nearly so; (2) process having a spur arising from it; (3) process as a rough eminence; (4) process as a smooth eminence. In close connection with this are two tubercles, usually very prominent where the paracondylar process exists, but sometimes present alone, which might be called the internal and lateral condylar tubercles respectively. The para-jugular canal is variable in diameter and length, and occasionally is double or even triple. The soft parts corresponding or in connection with the bony structures just described consist chiefly of ligaments bridging over the parts between two processes, or corresponding partly to portions ossified in the specimens above described.

Neck and Head in Infancy.—Dwight and Rotch[51, Sept.] give the results of their conjoint studies upon the growth and development of the head and neck in infancy. At 10 years the distance from the cricoid to the sternum is as great as in the adult, and this is accounted for by the subsequent descent of the larynx, and also, probably, by its proportionate enlargement (at least in the male) about puberty. The relationship of the face to the cranium at different periods is carefully given. Particular attention is given to the naso-pharynx and the pharyngeal tonsil,—points of great practical value to the general practitioner.

Position of the Stomach.—Tillaux[78, May 14] depicts the stomach in a vertical position, thus abandoning the older classical description, which represents it in a horizontal position. Another figure shows the jejuno-duodenal fossette united to the termination of the duodenum, and thus does the author recognize the great anatomical and surgical importance of the peritoneal fossettes, which is so universally overlooked.

Fossæ Around the Cæcum.—Lockwood and Rolleston[27, Oct.] have investigated 23 additional fresh examples of retroperitoneal hernia of the vermiform appendix, and have taken the opportunity of investigating, also, the more usual positions which the vermiform appendix may occupy. In 160 consecutive cases examined in which there was no manifest morbid condition of the abdominal cavity—such as peritonitis or local inflammation around the cæcum and appendix—the normal appendix was found free and pervious in 94, free and obliterated in 7, and free with cysts in 3; making 104 in which it was normal. In 56 it occupied an abnormal position.

Ferguson[5, Jan.] has published the results of 200 careful dissections of the vermiform appendix. The average length was four and one-half inches, and the average diameter that of a No. 9 catheter (English scale). In 123 cases the appendix was supplied with a mesentery of its own, and so placed that its perforation would open directly into the peritoneal cavity. Of these, the appendix lay to the outside of the cæcum in 19, to the inside in 18, behind in 75, and ran downward in 11. "The other group of 77 cases," continues the author, "was specially interesting in the fact that the appendix was so placed and covered by peritoneum that its perforation would open into the subperitoneal tissue and establish a diffuse form of peritonitis."

Studies of the Spine.—Dwight[224 Feb.2] presented, at the meeting of the Association of American Physicians, 13 specimens illustrating important lessons in the anatomy of the spine. Several anomalies were exhibited, and the opinion was expressed that it is of less importance to be able to map the divisions correctly than to be able to locate the attachments of the psoæ, the insertion of the diaphragm, or the lowest level to which the pleura descends.

Effect of Movements of the Human Body on the Size of the Spinal Canal.—Reid and Sherrington,[25 Mar.] from experiments undertaken to ascertain the possibility of an alteration taking place in the capacity of the cerebro-spinal canal during the performance of movements, ordinary and extraordinary, concluded that the alterations in the curvatures on the spinal canal by various movements of the body do influence the capacity of that canal, but not to any extent; much more, however, in the child than in the adult.

Anatomical Relations of the Gluteal Fold.—M. P. Thiéry[7 Apr.,May] gives an account of 20 dissections made for the investigation of the gluteal fold, and agrees with Luschka in attributing it to the presence of a pad of fat and to bands of connective tissue, which fasten the skin of the nates to the tuberosity of the ischium. The depth of the gluteal crease depends upon the degree to which the thigh is extended; on flexion it diminishes and obviates tension of the integuments. This fact may be of service in the diagnosis of some of the affections of the hips.

Relation of the Internal Epigastric Artery to the Abdominal Wall.—Rudolf Trzebicky[226 B.91; 99 Nov.19] had the misfortune to puncture either this artery or a considerable branch of it, in tapping the abdomen. He chose the spot advised by Monro,—the middle of a line from the navel to the anterior superior spine of the ischium. This induced him to investigate the question of the fitness of this spot. He examined in all 36 bodies. In a series of 23 bodies in which the abdomen was flat—that is, not distended—he found the artery running over the point in question in 5, in 1 of them on both sides. In 3 cases the artery was less than one centimetre distant. In 7 cases (in 2 on both sides) a muscular branch would have been in the way. The next series comprised 10 cases, in which the abdomen was prominent from ascites or fat. In 2 of these the artery crossed the point of election (once on both sides), and once was only one-half centimetre away from it. Moreover, in 6 a large branch crossed the spot.

Trzebicky experimented on 3 subjects to find out what effect the distension of the abdomen would have on the position of Monro's point. This was done by first marking the point, and then injecting water through the navel. He found that the point was displaced a little downward and more or less outward. He does not, however, attach much importance to this. He concludes that in most cases this point is a safe one, but still that in a considerable number either the main vessel or a branch is endangered. As a rule, the artery crosses the line from the umbilicus to the spine at the junction of its middle and inner third. The position of the artery is rarely the same on both sides. As the artery runs in the sheath of the *rectus*, its course, to a great degree, depends on that muscle. Still the relation is not a constant one, for in some cases the artery lies nearer the middle line on the side on which the artery was most displaced outward. The place of origin of the epigastric from the iliac seems to have no influence on its subsequent course.

Trzebicky is inclined, on anatomical grounds, to advise the *linea alba* for paracentesis. He points out, however, that it is important to keep strictly to the median line, as a strong anomalous branch may be found close beside it, which has been wounded with a fatal result. It is, however, very uncommon. If the *linea alba* be not chosen, he advises the outer half of the line from the navel to the iliac spine.

PHYSIOLOGY.

By W. H. HOWELL, Ph.D., M.D.,

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BLOOD.

In continuation of an investigation, begun some years ago, upon the specific gravity of blood in health and in disease (see Annual of 1888), Jones[178 v.12, p.200] gives a report of his most recent observations. The determinations were made by the method described in his previous paper. They have extended over a number of years, and have included over 1000 separate observations. The results reached are summed up at the end of the paper under forty-nine headings, the most striking of which are as follow: 1. The specific gravity of the blood varies in different parts of the body. 3. The specific gravity is usually the same, or nearly so, on corresponding parts of the symmetrical halves of the body. 6. The specific gravity varies considerably in different persons, so much so that the specific gravity which is normal in one may be a sign of disease in another. 8. In males the specific gravity is about 1066 at birth, falls during the first year and subsequent two years, being about 1050 in the third year; thence it rises till about 17 years of age, when it is about 1058. It remains as high during middle life and falls slightly in old age. 9. In females the specific gravity is about 1066 at birth. It falls in infancy, as it does in males, to about 1049 in the third year; thence it rises till about the fourteenth year, when it is 1055.5. Between 17 and 45 years of age it is lower than at 14, being about three degrees lower than in the male. 16. A specific gravity which would be normal in a light-eyed person may be a sign of disease in a dark-eyed person. (In the latter it is nearly always higher.) 17. Poor physique goes hand-in-hand with a low specific gravity of the blood, and good physique with a high specific gravity. 20. Regular exercise appears to increase the specific gravity of the blood. 22. Menstruation appears to cause a slight fall of specific gravity. 23. In chlorotic anæmia of young women, which occurs from 15 to 26, the specific gravity is always below normal. It may be as low as 1030, and frequently is as low as 1035. 25. In pernicious anæmia the specific gravity is always below the lower limit of normal health, and the degree of fall, which may even extend to 1029, corresponds with the severity of the case. 36. In the first week of typhoid fever the specific gravity is not much changed, but in the second and third weeks there is a marked fall; and this change is most marked in severe cases. 42. In scurvy the blood specific gravity is very low. 43. In phthisis the specific gravity is subnormal. Several interesting charts are given in the paper, showing graphically the limits of variation of the specific gravity in healthy males and females, the variations with age, etc.

From experiments made upon dogs, Grigorescu$^{410}_{p.561}$ finds that after a hearty meal there is a partial stasis in the circulation through the spleen, the maximum being reached about the third hour after digestion has begun. The proof of this stasis was obtained by direct measurements of the blood-pressure in the spleen-vessels. Observations with the hæmacytometer showed that there was an increase in the number of the red corpuscles and a fall in the number of white corpuscles, coincident with the stagnation of the spleen circulation. If the spleen was extirpated and the animal was given a good meal to digest, a rise in the number of red corpuscles could still be determined, reaching its maximum in the third hour; but the increase was proportionally less than in the normal animal. On the other hand, the white corpuscles showed an increase after digestion instead of a decrease, in the animals from which the spleen had been removed. The author concludes, from his experiments, that there is a causal connection between the variations in the number of the red and white corpuscles after a meal and the condition of the circulation in the spleen. The condition of partial stagnation, according to his view, leads to an increased production of red corpuscles in the spleen, the new corpuscles arising probably from a transformation of white corpuscles in the same organ. With reference to this conclusion, the objection may be fairly made that it is an illogical deduction from the facts upon which it is based.

Bizzozero$^{409}_{v.14,p.298}$ adds another to his many contributions to the subject of hæmatopoiesis. The present paper takes up the structure of the bone-marrow in birds, and the method of production in it of the red corpuscles. Bizzozero asserts, and gives quotations to prove, that he was the first to make known the significant arrangement of the blood-vessels in the marrow of birds. Briefly stated, in birds the red marrow is composed of a parenchyma and a network of blood-vessel and vascular areas. The capillaries of the marrow circulation before opening into the veins form wide venous capillaries filled with cells, which, according to the usually accepted account of Denys, to whom the credit of their discovery is given, are the areas of production of the young red corpuscles. The cells are arranged so that the fully-formed red corpuscles lie in the axis, and the erythroblasts, the colorless cells which give origin to the red corpuscles, lie at the periphery. Bizzozero shows that he had described this endovascular formation of the red corpuscles in the bird's marrow previous to Denys, but he contends that the so-called erythroblasts are merely the blood-leucocytes or else the young red corpuscles deprived of their hæmoglobin by the method of preservation of the tissues. He attempts to prove, in this paper, the view that he has always advocated, that the red corpuscle in its youngest stage always contains hæmoglobin, thus denying the generally accepted theory of erythroblasts. In birds repeatedly bled the marrow takes on a gray color, which, according to his view, is owing to the great increase of the leucocytes in the vascular areas, while, according to Denys, it is due to the multiplication of the erythroblasts. The parenchyma of the bird's marrow outside of the vascular area seems to take no part in the production of red corpuscles. According to Bizzozero, it forms leucocytes.

In an interesting paper upon the same general subject, Van der Stricht[2046] shows that in the embryonic liver there is an arrangement of vascular areas and liver-parenchyma similar to that described for the bird's marrow, and that the production of red corpuscles during embryonic life in the liver is also endovascular in the sense described for the marrow. The red corpuscles, according to his work, are developed from colorless erythroblasts, and in the mammal lose their nuclei by extrusion before passing into the circulation. The extruded nuclei may undergo gradual destruction while in the circulation, by chromatolysis, or may be ingested by the endothelial cells,—destruction by phagocytosis.

The action of an extract of the leech's head in preventing the coagulation of blood is well known. Dickinson$_{v.11,p.566}^{178}$ reports a new research upon the subject. He finds that the extract contains a proteid, which shows some resemblance in its chemical properties to the hemialbumoses, especially in its reactions toward nitric acid. But the action of leech extract in promoting blood coagulation differs from that of peptones (albumoses) in several respects. For example, if a second injection of the extract is made after the effect of a first has begun to wear off, the second injection will prove just as efficacious as the first. Moreover, the leech extract prevents coagulation readily if it is simply mixed with the blood as it flows from the vessels instead of being injected. The blood containing the leech extract cannot be made to clot by the action of CO_2, nor by neutralization with acetic acid, and when frozen it does not give a deposit of discoid bodies,—the fibrinogen A of Woldridge, which he got by freezing peptone plasma. Perhaps, the most interesting point brought out in the paper was developed in connection with the mixing of leech extract with solutions of fibrin ferment. The result of such a mixture is that the fibrin-ferment solution loses its fibrinoplastic properties. From this inactive solution a globulin may be prepared, which shows exactly the same properties as the cell-globulin β of Halliburton (see ANNUAL for 1889), with the exception that it no longer causes coagulation. Halliburton thought that he had proved that this globulin is the so-called fibrin ferment; but if the globulin may be obtained without showing fibrinoplastic properties, then the probability is strong that in Halliburton's experiments the ferment was simply carried down with the globulin in the methods of isolation employed by him. Thus, the nature of the fibrin ferment, whether proteid or not, remains undecided.

Shore$_{v.11,p.561}^{178}$ reports some curious results as to the effect of peptones upon the coagulation of lymph. Fano has shown that if a peptone solution is injected slowly into the blood, it has no effect upon its clotting. Under the same circumstances, according to Shore, the coagulation of the lymph may be prevented. On the other hand, rapid injection of peptone solutions will prevent the coagulation of blood, but does not affect the coagulability of lymph. It would seem, from these experiments, that a small quantity of peptone prevents the coagulation of lymph, while a large quantity has no effect, and that just the reverse is true for blood.

The reason for this difference is not given by the author, though he seems to think that, to some extent, it corroborates the theory of Heidenhain as to the origin of lymph, viz., that it is not merely filtered blood-plasma, but a secretion of the endothelial cells of the blood-capillaries.

Viault$^{8}_{\text{p.464, '90, Feb. 11}}$ calls renewed attention to a fact which was discovered some years ago by Paul Bert, namely, that residence in high altitudes causes a marked increase in the number of red corpuscles. Viault states that this increase takes place in a very short time, and gives the following figures: At Lima, October 4th, his blood contained 5,000,000 corpuscles to the cubic millimetre. On the 19th of October, after two weeks in the mountains, at an altitude of 4392 metres, the number was 7,100,000, and in the blood of Mayorga 7,300,000. On the 27th of October Viault gave 8,000,000 and Mayorga 7,440,000. It would seem from this that a diminished pressure of oxygen in the atmosphere, like a depletion of the blood from hæmorrhage, stimulates the hæmatopoietic organs to greater activity. The greater number of corpuscles in the blood increases, of course, its respiratory surface, and establishes again a respiratory equilibrium. In his second paper, Viault states that analyses of the gases of the blood of animals in high altitudes, as compared with those in low altitudes, show no sensible difference in the volume percentages of the gases.

MUSCLE.

The well-known sound of a muscle during contraction is usually explained as due to the vibrations of the muscle corresponding in number with the single contractions, which are fused together to make the tetanus. The rhythm of the voluntary contraction has not, however, been satisfactorily determined. According to Helmholtz, it is made up of from 18 to 20 simple contractions per second; according to a number of recent investigations, the rhythm is from 8 to 12, though the muscle-tone itself has a value of 40 vibrations per second. Whatever may be the true rhythm of the muscle contractions, and whether or not the muscle tone is directly explained by it, or is simply a resonance tone of the ear, it is universally taught that the number of simple contractions which are fused to make a voluntary tetanus is practically constant, and depends upon the normal periodicity of discharge of the motor nerve-centres. The rhythm of discharge of the nerve-centres is, therefore, probably a slow one, of 10 or 20 per second, according to the usual estimate. In two recent very important papers by Wedenski,[410] these accepted beliefs are seriously attacked, and a new fact, of fundamental importance, with reference to the causation of the normal muscle tone, is announced. He shows, in the first place, that when the motor nerve to a muscle is stimulated at different rates, the muscle is able to respond with isochronous contractions only up to a certain limit, and this limit, in cold-blooded animals, is as low as 200 stimulations per second; for warm-blooded animals it is higher,—about 1000 per second. If the rate of stimulation is pushed beyond this limit, then the muscle will respond with a tone of lower pitch, which corresponds in quality with the normal muscle tone, and the result is due to what Wedenski calls a transformed rhythm. The nerve-fibres in this case transmit the stimuli faithfully, but, from some peculiarity in the muscle or the end-plate, a certain number of the stimuli become ineffective, and the rhythm of muscular contractions suffers a transformation to a lower pitch. It should have been stated that Wedenski's experiments were made, by means of a telephone, with the muscle in the circuit, so that the action currents were transmitted. When the muscle was stimulated from 16 to 20 times a second, a corresponding tone was transmitted to the telephone, but the sound was quite different from that caused by a normal contraction. With rapid stimulation beyond the limits mentioned above, the muscle might respond, at first, by a feeble tone of the same pitch, but it soon changed to a lower pitch, being transformed in the muscle. In what way this transformation is effected, can only be explained theoretically. Wedenski's theory is the same as that used to explain the rhythmic contractions of the heart-muscle. He supposes that each contraction of the muscle-fibre leaves it in a condition of depressed irritability,—a refractory stage,—and stimuli falling into the fibre at this time are ineffective. This is followed, of course, by a phase of increased irritability, during which a stimulus causes contraction. The refractory stage varies in duration with the fatigue of a muscle, so that the transformed rhythm appears more quickly in a fatigued than in a fresh muscle. It varies also with the strength and rapidity of stimulation. Like others, he finds that when the cortex cerebri is directly stimulated, the resulting muscle contractions do not correspond in rhythm, as shown by the tone produced, with the rate of stimulation. This is explained ordinarily by supposing that the stimulus simply sets the motor centres in action, and that their discharge is made with the proper rhythm of the centres, and entirely independent of the rate of stimulation. Wedenski feels justified in adding to this that the transformation is chiefly effected in the muscle itself, since the tone—the normal muscle tone—is that caused by stimulating the motor nerve at a rate sufficiently rapid to produce a transformed rhythm. It would seem to be implied in this explanation, that the normal discharge of the nerve-centres, instead of having a slow rate of from 10 to 20, have a rhythm beyond the limit to which the muscle can respond isochronously. Certainly, from the stand-point of Wedenski, the rhythm of the muscle, however accurately determined, cannot give us any information as to the rhythm of discharge from the nerve-centres. Moreover, his experiments show that the rhythm of the muscular vibrations may vary with the intensity as well as the rate of stimulation; so that it is not so simple and constant as has been supposed.

By the aid of phenolphthalein as an indicator, Landsberger$^{246}_{v.50,p.339}$ finds that, if a muscle, is washed thoroughly in neutral saline solution, and the solution is then examined, its reaction is first neutral, but later on becomes acid. He infers from this that some material is washed out of the muscle, which, later, suffers a change with the formation of acid. What this material is the author was unable to discover, but he states his belief that it is of an albuminous nature. Upon this basis he attempts a reconstruction of some of the current notions as to the formation of acid in resting and contracting muscles. He considers that this preliminary material, from which the acid is produced secondarily, is being formed constantly in the muscle, and as constantly carried off in the blood-stream, there to give rise to its acid product. Under these circumstances, when the substance is removed before it undergoes alteration, the reaction of the muscle is neutral, as in the resting state. If the substance is not carried off, it suffers decomposition, with the formation of acid in the muscle itself. It is in this way that the acid reaction of the muscle in rigor is caused. On the other hand, if the production of this preliminary material is too rapid for its ready removal by the blood-current, some of it will likewise undergo decomposition in the muscle. In this way the acid reaction of the tetanized muscle may be explained. He makes the interesting statement that the amount of acid formed in a muscle during rigor mortis, under ordinary conditions, is not the maximal amount of acid which may be gotten from the muscle. Removal of the acid by neutralization or otherwise leads to a renewed production of new acid, thus indicating that the presence of acid in the muscle tends to inhibit the further breaking down of the preliminary material. If a muscle is left to itself until putrefaction sets in, then the total acidity obtainable will be developed, no matter how the conditions are altered; but if the muscle is kept in an alkaline medium, this total acidity, *i.e.*, total destruction of the preliminary material, occurs quicker, and before putrefaction comes on.

NERVOUS SYSTEM.

Livon,[46, June 30] proves, by graphic registration, that the contractions of the crico-thyroid muscle in dogs produce adduction of the vocal cords, owing to the effect of the contractions upon the thyroid. He further states that the muscle is supplied by a motor branch from the pharyngeal plexus, in addition to the fibres received from the external branch of the superior laryngeal.

Howell and Huber[178, v.12, p.4] report a study of the physiology of the communicating branch between the superior and the inferior laryngeal nerves. The branch lies under the wing of the thyroid, and in the dog is quite large. When isolated and stimulated, it was found to be composed entirely of afferent fibres, arising chiefly in the trachea. Direct stimulation of the nerve, as well as of the mucous membrane of the trachea, gave inhibition of respiratory movements, as in the case of stimulation of the superior laryngeal. The authors conclude that the communicating branch must be looked upon as a sensory branch of the superior laryngeal distributed to the trachea (and œsophagus), and having the same physiological value as the other fibres of the superior laryngeal, which end in the larynx.

Wedenski[410, p.68] calls attention to the fact that, with an ordinary nerve-muscle preparation from a frog, stimulation of the nerve may produce inhibition and relaxation of the muscle, as well as contraction. The conditions under which this phenomenon occurs are easily obtained. The muscle, if stimulated by induction-currents of sufficient strength to give maximal contractions, will become relaxed if the rapidity of stimulation is increased to a certain point. On the other hand, with frequent but weak stimuli, inhibition may be produced by increasing the strength of stimulation. An interesting and significant fact in this connection is that, in any given case where the stimulation is of sufficient rapidity and strength to cause inhibition, cooling the muscle causes the tetanic contraction to re-appear. The author believes that the inhibition is to be referred to the terminal apparatus—the motor end-plates—and that, in all probability, it is of essentially the same nature as the classical example of inhibition in the heart-muscle.

In continuation of experiments made some years past, Brown-Séquard $^{410}_{\text{pp.645,773,803}}$ reports a new series of observations upon the effect of CO_2 upon the mucous membrane of the larynx. If a quantity of this gas is blown over the membrane, either from below or from above, it brings on a condition of analgesia, best shown in wounds previously made in the skin, which may extend throughout the body, or may affect only certain regions. His best results were obtained from monkeys. In these animals the loss of sensibility to pain was so complete that mechanical or electrical stimulation of the large nerve-trunks caused no signs of pain, and this condition might last for several days. Outside of the analgesia, there was no disturbance of the motor or sensory functions; the animals could see and hear as well as before the experiment. Mixture of oxygen or of atmospheric air with the CO_2 made its effect much less distinct. According to the author, the action of the CO_2 must be explained as an inhibition of the pain-centres from peripheral stimulation of the sensory endings in the laryngeal mucous membrane. In a second paper, he gives a number of experiments to prove that wounds made in various parts of the body may be rendered analgesic for a longer or shorter time by traumatic or mechanical irritation of the larynx, or, to a less degree, of the trachea or of the skin of the neck. Galvanic stimulation of the larynx or of the superior laryngeal nerves brings about a similar result. In a third paper, the results of his experiments are summarized in a number of propositions, the chief of which is the following: 1. In the dog or monkey, wounds made before, during, or shortly after certain irritations of the mucous membrane of the larynx, or of its sensory nerves, show always a diminution or total loss of sensibility to pain during the next day, or for a longer time. A better idea of the nature of the experiments may be given by a short extract from a report of one of them: Experiment II. May 27, 1883. Large Macaque monkey. Palms of hands sensitive to induction-currents at a distance of 8 to 9 of secondary coil. Wounds of axilla and groin at 10, lips and nostrils at 11. At 3 o'clock CO_2 gas, 25 litres (25 quarts), passed over epiglottis and glottis by way of mouth. At quarter past 3 o'clock the palms, axilla, groin, etc., insensitive to maximal stimulation, etc.

The two characteristic micro-chemical reactions of the medullary sheath of nerve-fibres are the so-called myelin formations produced by the action of water, and the black color with osmic acid. Gad and Heymans$^{820}_{\text{Phys. Ab., p. 480, '90}}$ have investigated the chemistry of the myelin sheath, with the special purpose, apparently, of determining whether these two reactions are due to some particular constituent of the sheath or are produced by the mixture of substances found in it. They find that after prolonged treatment with water the sheath still stains black with osmic acid, proving that the substance giving this reaction is not soluble in water. On the other hand, fibres treated with alcohol no longer give the myelin drops with water or the black color with osmic acid, proving that the substance or substances responsible for these reactions are soluble in alcohol. The alcoholic residue, when the solution is evaporated to dryness, gives the black reaction with osmic acid, and swells upon the addition of water. If the alcoholic residue is dried at 40° C. (104° F.), and treated with ether, a part of it dissolves and a part remains unaffected. The portion not soluble in ether may be obtained in a crystalline form from its alcoholic solutions, and they believe it to be identical with protagon. The part which is soluble in ether contains cholesterin, and in addition the substance which stains black with osmic acid and gives the myelin formations with water. As far as they were able to determine the properties of this latter substance it is closely similar to lecithin. They propose to speak of it as lecithin, and to restrict the term myelin to this substance or this form of lecithin as it occurs in the medullary sheath. Applying this result to the histology of nerve-fibres, they suggest that medullated and non-medullated nerve-fibres might be more satisfactorily named, respectively, myelin-containing and myelin-free fibres. They made a histological examination of the sympathetic or non-medullated fibres, and came to the conclusion that nerve-fibres of this character undoubtedly do exist, but that, instead of consisting of axis-cylinder and sheath of Schwann, they are made up of an axis-cylinder, surrounded by a protoplasmic sheath, which would correspond to the nucleated protoplasmic layer under the sheath of Schwann (primitive sheath) in medullated nerve-fibres; this they name the myelin-free sheath.

Bechterew$^{320}_{\text{Phys.Ab.,p.480,'90}}$ reports a number of vivisection experiments made to determine the functions of the posterior columns of the cord. The experiments were made upon pigeons, rabbits, and dogs. The spinal column was opened in the upper portion of the cervical region, and, by means of a specially-constructed knife, the columns of Goll and Burdach were cut; an exact limitation of the section was only possible in dogs. The extent of the lesions was verified by post-mortem, and in some cases by histological examinations. The results were as follow: Pigeons, after the temporary movements (of excitation) occuring immediately after the section, showed marked disturbances of equilibrium. They could hold themselves erect upon their feet only with difficulty and by using the tail-feathers as a support, and oscillation or swaying of the body was very marked. The locomotion was, therefore, uncertain, and marked by swaying movements, which were more pronounced if the eyes were covered. Nevertheless, there was no paralysis and apparently no loss of sensibility in the feet and legs. The disturbances of equilibrium might last for several months, though they became gradually less noticeable. In rabbits, the sections were made at the second or third cervical vertebra, and resulted in similar disturbances of equilibrium, which lasted, in some cases, for several weeks. The animals fell to one side or the other in jumping, and the loss of co-ordination was more marked when the eyes were closed. There was no diminution in the sensibility to pain in either extremity. In dogs, the results of the operations were similar. The animals showed an uncertain gait, swaying from side to side, the disturbances lasting for several weeks. No loss of sensibility could be detected. Section of the inner bundles (Goll) of the posterior columns gave similar troubles of equilibrium, though not so marked as after destruction of the whole column. He thinks that most probably the afferent stimuli which pass through these columns, and which play such an important part in maintaining equilibrium, originate in the skin. As some proof for this view, he cites the case of frogs and pigeons in which the skin had been stripped from the legs, after previous removal of the cerebral hemispheres. In such animals, disturbances of equilibrium were very distinct. He quotes, also, cases of tabes, in which there was no loss of sensibility, but, nevertheless, a characteristic uncertainty of gait, when the eyes were closed. He concludes that the posterior columns conduct impulses which are neither tactile nor muscular, but are especially concerned in the control of the equilibrium centres, through their connections with the cerebellum.

If the inferior peduncles of the cerebellum were cut, the disturbances of equilibrium were more marked than after simple section of the two posterior columns, and this leads him to believe that the direct cerebellar tracts, which take part in the formation of the inferior peduncles, play a part in relation to the equilibrium centres similar to that assumed for the fibres of the posterior column. Bechterew seems to believe that his work proves the existence of a new physiological variety of nerve-fibres, which, for brevity's sake, might be called equilibrium fibres, though the usual view is that the phenomena he describes are sufficiently accounted for if we suppose that the columns of Goll, Burdach, and the cerebellar tract (?) contain fibres of muscular sensibility. In the beginning of his paper, Bechterew states briefly that, according to his researches, the fibres of the column of Goll arise partly from the cells of the posterior horn and partly from Clark's column of the same side, while the fibres of the column of Burdach came almost exclusively from the column of Clark. Contrary to the usual belief, he does not think that any of the fibres of the posterior column are continued directly from the posterior roots without the interposition of cells in the cord.

A second series of experiments, of a somewhat similar character, have been made by Martinotti.$^{320}_{\text{Sup.Bd.,p.188,'90}}$ It has been stated, both for man and the lower animals, that section of the cord may produce hyperæsthesia in the parts beneath. The object of Martinotti's research was to determine just what portion of the cord, when injured, leads to this result. The animals used were rabbits, and the operations were performed upon the cervical cord. After the cord was exposed, it was cut with a small knife, kept at a red heat, which was inserted into the cord through the dura mater. The exact extent of the lesion was determined after the death of the animal, and photographs were made to show the areas injured in the different experiments. In some cases the animals were killed a few hours after the operation, while in other cases they were allowed to live until the wound had completely healed. From numerous experiments, the author concludes that the portion of the cord injury to which is followed by hyperæsthesia is limited to the posterior inner portion of the lateral column, and outward from this along the posterior horn to the surface of the cord; in that region, therefore, in which the direct cerebellar and crossed pyramidal tracts are found in man. The paper makes no mention of any disturbances of equilibrium, though in some cases the direct cerebellar tract, and, in others, the column of Burdach, were cut through. To explain the hyperæsthesia, he suggests that the sections removed some obstruction of the nature of an inhibition, which normally interferes with the passage of sensory impulses to the brain.

Carrying out their previous experiments on the action of nicotine on the peripheral nerve-cells (see ANNUAL, 1891), Langley and Dickinson[178, v.ii, p.509] attempt to determine the effect of a number of other alkaloids. For their experiments they used the superior cervical ganglion of rabbits, painting it directly or injecting the solutions into the blood. The following results were obtained with 1-per-cent. solutions: Atropine, hyoscine, eserine, muscarine, pilocarpine, antipyrin, picrotoxin, caffeine, and quinine have no effect upon either the ganglion-cells or the nerve-fibres of the sympathetic; on the other hand, aconitine, codeine, apomorphine, and cocaine destroy the irritability of nerve-fibres (sympathetic) more or less readily, the action of aconitine nitrate being especially marked.

Sympathetic Nervous System.—Morat and Doyon[410, p.507] report a new factor in the mechanism of the accommodation of the eye. Accommodation, as usually explained, is effected entirely through the third cranial nerve. When the normal eye is at rest, it is focussed for parallel rays, owing to the flattening of the lens by the suspensory ligament. To accommodate for nearer objects, the ciliary muscle is contracted and the pull of the suspensory ligament is lessened, allowing the lens to become more convex. The theory is simple, and apparently sufficient. The authors of the present paper state that when the peripheral end of the cervical sympathetic in dogs, rabbits, or cats is stimulated, the crystalline lens becomes flattened. The flattening was determined, in their observations, by noticing the size of the image reflected from the anterior surface of the lens,—the second image of Purkinje. When the sympathetic was stimulated the image became larger and more diffuse. That this was not merely an indirect result of vasomotor influences, as might be supposed, they demonstrated satisfactorily by stimulating simultaneously the vagus nerve of the heart, thus interrupting the flow of blood. There is no muscle in the eyeball which, by contracting, can flatten the lens, and the authors are obliged to explain their result by supposing that the sympathetic sends inhibitory fibres to the ciliary muscle or to the nerve-ganglion supplying the muscle. The sympathetic, in other words, acts as an inhibitory nerve of accommodation, and the third cranial as the motor nerve of accommodation, occupying the same physiological relationship to each other, as in the case of the sphincter muscle of the iris. It follows from this that accommodation of the eye for distant objects is not simply a passive act, but may involve an active innervation through the sympathetic. The author quotes clinical cases, to show that lesions of the cervical sympathetic have been known to cause limitations of the power of accommodation, myopia, etc.

From experiments made upon the cervical sympathetic of curarized cats by Nawrocki and Pryzbylski,[246 v.50,p.394] with reference to the course and action of the dilator fibres of the pupil, the following results are reported: 1. The pupil-dilating nerve-fibres arise in the brain, pass into the cord, and emerge in the roots of the eighth cervical and first and second dorsal spinal nerves. They reach the first thoracic ganglion of the sympathetic chain through the rami communicantes of the eighth cervical and first dorsal (sometimes, also, of the second dorsal), and pass upward through the annulus of Vieussens and cervical sympathetic to the superior cervical ganglion. From this last ganglion they enter the skull-cavity, make connection with the Gasserian ganglion, and thence pass for distribution in the first branch of the trigeminal. Section of the trigeminal, therefore, to the distal side of the Gasserian ganglion destroys the action of the sympathetic nerve upon the pupil. 2. In passing to the eyeball these fibres do not connect with the ciliary ganglion, but reach their destination through the long ciliary nerves. 3. Though the bulk of the dilating fibres take the course described above, some must reach the iris by a cerebral (trigeminal) path, since, after extirpation of the superior cervical ganglion, stimulation of sensory nerves will give a distinct, though weak, dilatation of the pupil. 4. A centre for these fibres lies in the brain (the position was not determined), but the so-called lower cilio-spinal centre at the junction of the cervical and dorsal cord probably does not exist, since, after section of the cord below the medulla, they were unable to obtain reflex dilatation of the pupil by stimulation of the sciatic nerve.

Arloing has recently shown (see ANNUAL, 1891) that the cervical sympathetic carries both secretory and inhibitory fibres to the lachrymal gland and the glands of the muzzle of the ox. In a new paper,[410, p.100] he attempts to prove that, in addition to these and the vasomotor and pupil-dilating fibres, the cervical sympathetic contains also true trophic fibres. His experiments were made upon the muzzle of the ox and the dog's nose. The cervical sympathetic was cut on one side, and, after a certain time, the epithelium of the mucous membrane at the end of the nose became dry and very much increased in thickness, especially in the horny layer,—the difference between the two sides of the nose being so marked that it was clearly perceptible to the eye. Like most of the similar experiments made to demonstrate the existence of distinct trophic fibres, they are open to interpretations of a different kind, such as perverted nutrition indirectly resulting from the destruction of the secretory or vasomotor fibres supplied to the same parts.

The well-known erection of the hair (horripilation) in many animals, *e.g.*, the cat, which depends upon the contraction of the erector muscles, has been shown by Langley and Sherrington[178, v.12, p.373] to be under the influence of non-medullated nerve-fibres, to which the authors give the name of pilo-motor fibres. The anatomical origin and course of these fibres in the monkey were worked out by Sherrington, and in the cat by Langley. For the head-region of the monkey (forehead, front half of scalp, temple, cheek, upper part of the whisker), the fibres leave the cord chiefly in the anterior roots of the third and fourth thoracic nerves, pass to the sympathetic chain, and reach the head through the cervical sympathetic. Erection may be produced easily by stimulating the fibres in any part of their course. For the buttocks, thigh, and tail the fibres emerge from the cord in the twelfth thoracic and first, second, and third lumbar spinal nerves, and pass to the sympathetic chain. In the cat the outflow from the cord occurs in each spinal nerve, from the fourth thoracic to the third lumbar. Those coming out in the fourth to the seventh thoracic turn upward into the cervical sympathetic for distribution to parts about the head. The others pass into the corresponding parts of the sympathetic chain, and are distributed to the hair in a strip along the back and throughout the whole extent of the tail.

In addition to the above, Langley$^{178}_{\text{v.12, p.347}}$ contributes a very careful and complete account of the course and connections of the sweat-fibres supplying the glands in the cat's feet. The paper contains tables and illustrations, which give in detail the results of the author's experiments and dissection. With reference to the emergence of the sweat-fibres from the cord, he finds that sweat is produced most abundantly in the hind-feet when the first and second lumbar nerves are stimulated, less abundantly when the thirteenth dorsal is stimulated, and still less so when the twelfth dorsal or third lumbar is stimulated; so that the outflow, though it may extend from the twelfth dorsal to the third lumbar, takes place chiefly through the first and second lumbar. As a probable explanation of discrepancies in former accounts, Langley calls attention to the fact that not unfrequently an extra spinal nerve occurs in cats, making a total of fourteen instead of thirteen, and this has possibly led to confusion in naming the nerves stimulated. With reference to the emergence of the sweat-fibres from the sympathetic chain as non-medullated fibres, his experiments show that they may escape through the gray rami communicantes of the sixth lumbar to the second sacral ganglion, but that the greatest outflow is found from the seventh lumbar or the first sacral ganglion. In the ganglion the fibres are presumably in connection with nerve-cells, and, since nicotine injected into the blood or painted on the sympathetic destroys the effect of stimulating the sympathetic chain above the sixth ganglion, but has no effect upon stimulation of the gray rami from the ganglia named, he concludes that the fibres make no other connections with nerve-cells of the sympathetic type lying peripherally to these ganglia. It has been frequently stated that some sweat-fibres pass directly from the spinal cord into the sciatic nerve without entering the sympathetic chain, but Langley's experiments gave him very decisive proof to the contrary. The sweat-fibres to the fore-feet of the cat leave the cord in the fourth to the ninth or tenth thoracic spinal nerves, the maximum number passing out from the sixth to the eighth. They all seem to undergo the transition to non-medullated fibres in the first thoracic ganglion, and thence pass through its gray rami communicantes to the spinal nerves forming the brachial plexus. In a second less complete paper,[178, v.12, p.376] he states that the vaso-constrictor and vaso-dilator fibres to the fore- and hind- feet, respectively, take the same course as the sweat-fibres. As a general conclusion from his work upon the physiological anatomy of the sympathetic chain, he states that "each ganglion of the sympathetic chain is, in the main, the nerve-cell station for the nerve-fibres which run from it to the corresponding spinal nerve.

From experiments made upon rabbits, Langley,[2040, No.6, '90] finds that the descending colon receives its motor fibres from the second, third, and fourth sacral nerves, and its inhibitory fibres from the rami of the lumbar sympathetic, which connect with the inferior mesenteric ganglion. The motor and inhibitory fibres of the rectum and bladder have the same origin, but the uterus receives fibres only from the sympathetic, since stimulation of the sacral nerves gave no contractions in this organ. The sympathetic supply to the uterus comes from the fourth to the sixth lumbar ganglia through the inferior mesenteric ganglion. As regards the vagina, either contraction or inhibition, or flushing or pallor, may be obtained by stimulating the sympathetic chain from the second lumbar to the fourth sacral. These fibres, for the most part at least, reach the vagina without passing through the inferior mesenteric ganglion and the hypogastric nerve. Stimulation of the sacral spinal nerves gives congestion or pallor of the vagina also, the former chiefly when the third and fourth sacral are stimulated, and the latter upon stimulation of the first and second sacral. The nerve-supply to the penis of the male has the same origin. The statement has sometimes been made that, in the colon and rectum especially, the sacral nerves cause contraction of the longitudinal and inhibition of the circular layer of muscle, and the sympathetic fibres just the reverse. Langley was unable to get such results. On the contrary, stimulation of the sacral nerves gave him contractions of both coats, and stimulation of the sympathetic inhibition of both coats, playing the same parts respectively as the vagus and the splanchnic for the small intestine.

Nawrocki and Skabitschensky[246, v. [illegible]] publish a description of the nerve-supply to the bladder as found in the cat and rabbit. The description is accompanied by an excellent plate. They find that the motor nerve-fibres to the muscles of the bladder are derived immediately from the plexus vesicæ, which lies around the neck at the junction with the urethra. This plexus is made up in part of fibres from the second and the third sacral spinal nerves and in part of fibres from the hypogastric nerve, which, in turn, originates in the inferior mesenteric ganglion, and the motor fibres to the bladder reach it along both these routes. In detail, then, some of the motor fibres of the bladder have the following course: From the fourth and fifth lumbar nerves, through the rami communicantes to the sympathetic chain, to the mesenteric nerves, to the inferior mesenteric ganglion, to the hypogastric nerve, to the hypogastric plexus, to the vesical plexus. The others take a more direct path from the second and third sacral spinal nerves, to the hypogastric plexus, to the vesical plexus. There seems to be a discrepancy between this and the research by Langley, just noticed, as to the function of the fibres taking the longer path through the sympathetic system. According to Langley they are inhibitory; according to Nawrocki they are motor.

CIRCULATION.

Gley[410, p.725] has investigated, with some care, the phenomenon of the stoppage of the heart by direct strong electrical stimulation. As is well known, the ventricle of the dog or cat, under such stimulation, goes into inco-ordinated fibrillary movements, from which it does not recover. The ventricle of the rabbit or guinea-pig, on the contrary, after similar treatment, may recover its normal rhythmic beat. Gley finds that a heavily chloralized dog, or a newly-born dog, behaves in this regard like a rabbit. He is inclined to believe that in the mammalian heart there is a nervous, co-ordinating mechanism or centre, such as Kronecker and Schmey have postulated to explain the sudden stoppage of the heart from puncture. In the mechanism of the heart-beat they suppose that this centre is superadded to the rhythmically contractile musculature, and that it is more highly developed in the dog than in the rabbit. In the heavily chloralized dog this centre is depressed; hence the ability of the heart to stand rougher treatment. In the newly-born dog it may be supposed that the centre is not fully developed, and has not, therefore, assumed its full importance. Gley adds, further, that repeated shocks to the rabbit's heart—two or three successive effective faradizations of the heart—will exhaust it to such an extent that it cannot recover its power of rhythmic contractility. If we may trust the reports of the recent electrocutions in this country, it would seem that the human heart acts toward powerful induction-shocks after the manner of the rabbit's heart, and unlike that of the dog.

François-Frank $^{410}_{p.478}$ calls renewed attention to the fact, already, perhaps, sufficiently demonstrated, that the vagus-fibres, when stimulated, not only slow or inhibit the contractions of the heart-muscle, but remove the previous tonic condition of the muscle, causing a relaxation greater than that of the normal diastole. He gives a number of tracings, which show the greater relaxation and extensibility of the myocardium of both ventricle and auricle during vagus stimulation. The article is stated to be introductory to a future discussion of clinical cases, in which, according to the author's view, there had been produced an atonic condition of the heart musculature from purely nervous influences, leading secondarily to heart troubles, such as auriculo-ventricular insufficiency.

In a critical article upon the nature of the first sound of the heart, Haycraft $^{178}_{v.11,p.486}$ objects very strongly to the more or less generally accepted view that this sound is chiefly a muscular tone. Starting out with the statement that the muscle tone, as usually understood, is not a muscle tone at all, but a resonance tone of the ear, having a value of about forty vibrations a second, he gives some valuations, made by himself and a musical friend, of the pitch of the heart-sounds. According to these determinations the heart-sounds in the rabbit, dog, and man are always in the bass clef, and the second sound is about a minor third higher pitched than the first, though both sounds are much higher than the ordinary muscle tone. He states, moreover, that in a bloodless but still beating heart, as in the quickly excised heart of a rabbit, the first tone is much lower than in the normally beating heart, in which the auriculo-ventricular valves come into play. The bloodless heart gives a sound, to be sure, and this has always been the strong argument in favor of the muscular origin of the first sound. Haycraft states that it is distinctly lower than the normal first sound, and explains its occurrence by supposing that the impulse of the contraction transmitted to the ear arouses the resonance tone of the ear, as in the case of the contractions of the skeletal muscles. As a final proof of his position, he isolated a heart and connected it with a reservoir of water, so that the column of water could be made to close mechanically and successively the semilunar and the auriculo-ventricular valves. Under such conditions he got two purely valvular sounds, which could be placed in the bass clef, and differed from each other by a minor third, agreeing, therefore, closely with the normal heart-sounds. His conclusion is, that the first heart-sound is an impure musical note, a minor third below the second sound, and in the bass clef. It is a valvular sound, like the second sound. It is accompanied by resonance tones, both of the chest, stethoscope, and the ear, these tones being produced by the shock of the contracting heart.

Koeppe[320, Sup Bd., p 164, '90] has made a careful histological study of the portal vein, its roots of origin, and its branches in the liver, with reference to the valves and the musculature. The veins were hardened by injection with potassium bichromate, and then dissected under the dissecting microscope. He finds that the portal vein itself and its main branches have no valves, but are provided with a strong musculature, longitudinal as well as circular. The long and short veins in the muscular wall of the intestine are richly provided with valves, and the muscular layer is chiefly circular. The veins in the submucosa have neither valves nor muscular walls. The arrangement of the musculature in the branches of the portal in the liver follow just the reverse plan, the circular layer disappearing more rapidly, so that the finer branches have only longitudinal fibres.

According to Wertheimer and Colas,[410, p.341] when one injects 5 to 10 milligrammes of nicotine into the blood of a dog there follows a definite series of effects upon the circulation. At first the pulse becomes slower and the arterial pressure falls; then, while the pulse remains slow, the pressure begins to rise, at first slowly, then more rapidly; and finally, at the end of this stage, the heart-beat also becomes accelerated. In the next phase the pressure begins to fall again, but the heart-beat continues fast, and toward the end of this stage the pressure may have fallen below the normal and the pulse become slower once more. This complexity of phenomena indicates that the nicotine acts upon both the heart and the blood-vessels, and the authors have endeavored to separate these two actions. As far as the nicotine affects the heart, the authors believe that it has an accelerating action, due chiefly to its direct effect on the intra-cardiac ganglia. They are led to this view because, when the accelerator centre in the medulla was cut off by section of the cord below the medulla, and the vagi and the inferior cervical and first thoracic ganglia were thrown out of connection with the heart, the nicotine still produced in one stage of its action an acceleration of the beat. Under these conditions, the drug can influence the heart only by acting on it directly, and, according to the authors, only by affecting the intra-cardiac centres; though one might object to this that there is a possibility that the nicotine may affect the heart-muscle itself. With reference to the effect of the nicotine upon the blood-vessels, they proved, by directly measuring the volumes of the kidney and spleen, that during the period of rise of pressure these organs decrease in size, thus showing a general constriction in the splanchnic area. During this general constriction, they noticed that the mucous membrane of the lips and tongue showed a distinct congestion, proving the existence of a local dilatation, simultaneous with a general constriction throughout the abdominal viscera. They demonstrate that in this case, also, the action of the nicotine is, in part at least, peripheral. For, after complete destruction of the spinal cord, injection of nicotine is still able to produce a rise of pressure. So, after complete section of the nerves supplying the tongue and lips, injection of nicotine gives a local flushing in these parts coincident with a general rise of pressure. To explain this peripheral action, the authors suppose that the drug stimulates the peripheral ganglia lying in the neighborhood of the blood-vessels, whose existence has been supposed more particularly to account for the phenomenon of vaso-dilatation. These ganglia have not been actually demonstrated, and the authors consider their results as an indirect physiological proof of their existence; though, of course, the possibility is present that the nicotine may stimulate simply the peripheral endings of the nerve-fibres, the vaso-constrictors in one region, and the vaso-dilators in another.

RESPIRATION AND HEAT REGULATION.

Gad and Zagari $^{320}_{\text{Phys.Ab.,p.488,'90}}$ confirm an older experiment by Berns, according to which the inspiration of CO_2 gas causes a deepening of the inspiratory movement. They had their animal arranged in such a manner that it could be made to breathe either air or CO_2 through a tracheal cannula, and in this way they were able to show that when the CO_2 was first turned on there was an increase in the depth of the inspiratory movement. To ascertain from what extent of the mucous surface of the lungs this reflex could be obtained, they passed glass tubes down the trachea beyond the bifurcation to such a distance into the lung that only the smaller bronchi would be exposed to the gas. Under these circumstances inspiration of the CO_2 had no effect. They conclude, therefore, that the CO_2 acts as a stimulus only upon the mucous membrane of the larger bronchi, though this conclusion is weakened by the necessarily rough treatment to which the bronchi were exposed in the experiment described. The reflex, as obtained from the tracheal cannula, was not destroyed by section either of the inferior or of the superior laryngeal nerves. From this it would seem that the afferent fibres concerned in the reflex reach the vagus at a point below the giving off of the recurrent laryngeal.

Sherrington $^{178}_{\text{v.12,p.392}}$ states that if a frog is deprived of his cerebral hemispheres and thalami, and is then left quietly to himself for a period of twenty-four hours, or longer, he exhibits, or may exhibit, a periodic type of respiration, with a rhythmically recurring increase and decrease in the size of the respiratory movements, and comparable, therefore, to the well-known Cheyne-Stokes respiration. If the animal was disturbed, his breathing at once took on the type normal to frogs. The observation is interesting, in connection with the statement made by Mosso that, in the human being, during deep sleep, the respiratory movements show an approximation to the Cheyne-Stokes type.

A contribution to the same subject is made by Wertheimer. $^{410}_{\text{p.172}}$ He finds that, in dogs, stimulation of the central end of the vagus may bring on periodic respiration, showing an ascending and descending scale, after the manner of the Cheyne-Stokes breathing.

He obtained this effect in some cases from electrical stimulation of the vagus, but most successfully by chemical stimulation; that is, by bringing the cut end of the nerve in contact with a crystal of NaCl, etc. This fact seems to the author to serve as a confirmation of a theory of the cause of the Cheyne-Stokes respiration which he had previously published. According to his view, the essential factor in the production of this type of respiration is an incomplete inhibition of the respiratory centre, such as may be conceived to be the result of a continuous stimulation of the afferent nerves, as in his experiments. The theory does not seem to account satisfactorily for the periodic breathing of deep sleep in man or the same phenomenon in frogs after removal of the fore-brain and thalamus.

In continuation of his previous work upon the location of the cerebral heat-centres, White[178, v.12, p.233] reports a long series of experiments upon the effect of lesions of the brain, in rabbits, upon the body-temperature as measured in the rectum. The more important results of his work may be stated briefly in his own language, as follows: 3. Lesions of the corpus striatum, if not large enough to give rise to shock and severe hæmorrhage, cause a considerable rise of temperature. 4. Lesions of the septum lucidum also cause a rise of temperature. 5. Lesions of the optic thalamus do not alter the temperature. 6. Lesions of the white matter around the corpus striatum and optic thalamus do not cause a rise of temperature. 7. Lesions of the cerebellum do not alter the temperature. 8. Lesions of the anterior part of the upper surface of the cerebral cortex either do not alter the temperature, or the alteration is very slight. 9. Lesions of the posterior part of the upper surface of the cerebral cortex may cause irregular rises of temperature, which are quickly produced and last only a short time; sometimes there are several rises and falls after one operation. 10. Lesions of the crus cerebri cause a considerable rise of temperature. A rise of temperature, such as was recorded in these experiments, in itself, gives no positive indication of variations in heat-production or heat-loss, but the presumption is that the rise of temperature in each case meant an increase in heat-production. The results, like those reported by other experimenters in the same field, are too complicated to be easily explained. The number of places in the brain, lesions of which are followed by variations in heat-production, is so great that any simple explanation of their interdependence is difficult to give, and it is more than certain that both a better knowledge of the finer anatomy of the brain and a greater number of calorimetric experiments must be at hand before the results can be fully appreciated. Perhaps, the most interesting outcome of the experiments is the definite statement that the thalamus is probably not concerned in heat-regulation, while the corpus striatum undoubtedly has some distinct function in that connection. In this latter point the author is in accord with other recent writers upon the same subject.

Reichert$^{80}_{\text{Mar., Apr.}}$ publishes an account of calorimetric experiments made upon dogs, for the purpose of determining the effect of curare upon heat-production and heat-dissipation. The effect of curare upon the body-temperature varies with the size of the dose, but even when the dose is the same, according to Reichert, the effect may be quite irregular. Large doses—that is, doses more than sufficient to abolish completely all voluntary movements—cause, when first given, a fall of temperature. Doses just sufficient to prevent voluntary movements may cause either a rise or a fall of temperature, while doses too small to produce complete paralysis give at first a rise of temperature, as was previously shown by Kemp (see ANNUAL, 1890). When these doses were repeated in connection with calorimetric observations, it was found that the fall of temperature with large doses is due chiefly to an increased heat-dissipation. The effect upon heat-production with such doses is much less marked, which is contrary to what we might have expected, considering the large part that the tonic innervation of the muscles is supposed to take in heat-production. The slight rise of body-temperature following upon doses of curare insufficient for complete paralysis was found to be correlated with an increase in the production of heat. Reichert believes that one fact brought out in his experiments may prove to be useful, viz., that a dog may be kept under curare for hours without affecting materially the production of heat. If this is true, the action of heat producing or modifying reagents may be tested in connection with the curare, with the assurance that the muscular system, as far as it is affected through the heat-regulating mechanism, is eliminated from the problem. Subsequent injections of caffeine and curare, and cocaine and curare, upon animals while in the calorimeter, proved that the curare, even in light doses, may prevent the cocaine from causing its usual striking increase in heat-production, while the action of caffeine under similar circumstances is but slightly influenced by the curare.

DIGESTION AND NUTRITION.

In the gastric glands of a portion of the mucous membrane of the stomach we have two kinds of cells,—the chief and the parietal cells. To the latter Heidenhain has attributed the function of making the HCl of the gastric secretion, while the chief cells produce the pepsin. No direct proof has been given for this function of the parietal cells, but, as one point in its favor, an observation by Zwiecicki is often quoted. According to Zwiecicki, the glands of the œsophagus in the frog yield only pepsin, and histologically agree in structure with the chief cells of the mammalian gastric glands, while the gastric glands of the frog secrete only HCl and no pepsin, and histologically resemble the parietal cells in the mammalian glands. In a recent paper Fränkel[246, B.48,p.68] repeats these observations, and demonstrates, apparently very satisfactorily, that, in both winter and summer frogs, pepsin can be obtained easily from the stomach as well as the œsophagus. Aqueous extracts from each of these places, when acidified, digested fibrin readily; so that the supposed separation of functions in the frog can no longer be used in support of Heidenhain's theory. The author afterward turned his attention to the formation of acid in the mammalian stomach, with the hope of being able to demonstrate, by some of the better micro-chemical tests for free acid, whether or not the parietal cells are responsible for its formation. His injections gave him negative results, as far as the chief point at issue was concerned. He developed, however, a new and easy method of demonstrating the acid reaction of the mucous membrane of the stomach. A 5-per-cent. solution of acid fuchsin was prepared, and was first decolorized by alkali and then injected into the circulation of a dog. The animal was afterward killed, and its gastric mucous membrane was found to be stained a bright red, owing to the presence of the free acid in it. When sections of the mucous membrane were made, all of the cells of the secreting tubules were found stained, the parietal as well as the chief cells.

A second, and more serious, attempt at an explanation of the origin of the HCl of the gastric juice—as far, that is, as its chemical genesis is concerned—is found in a paper by Liebermann.$\frac{246}{\text{B. 50, p. 35}}$ He states that he has been able to prepare from the gastric mucous membrane a nuclein-like body, which his analysis showed to be a compound of albumen and lecithin, and for which he proposes the name, lecithalbumen. This body has a strong acid reaction, and he thinks that, physiologically and chemically, it is sufficiently closely allied to the nucleins to justify the opinion that it is derived from the nuclei of the mucous membrane.

Without giving all the details, his method of preparation was as follows: The finely-divided mucous membrane was thoroughly washed with cold water, until the water was no longer colored red. The washed mass was acidified and digested with pepsin for several days. At the end of this time a layer of undigested, mucus-like material was found at the bottom of the vessel. After thorough washing with acid and water, and subsequently with water, alcohol, and ether, the mass was dried at a low temperature. A light, brownish powder was obtained, which was granular under the microscope, and the granules of which stained readily with all the ordinary nuclear stains. It contained sulphur and phosphorus, though the latter could not be obtained from it in the form of metaphosphoric acid. From this substance, he was able to form lecithin, by prolonged boiling in alcohol, and the residue had the properties of an iron containing albumen. He made a number of analyses of the various preparations of the body, to prove that the lecithin and the albumen were chemically combined, and were not present simply as a mixture. The strong acid reaction of this body led him to suppose that it might take a direct part in the formation of the free HCl. He accordingly made experiments, to see whether it was able to break up NaCl with the formation of free HCl, but met with only negative results. However, he suggests a rôle which his new substance may take in the formation of the acid of a more indirect and complicated character. His theory rests upon two observations: first, that this lecithalbumen, when brought into contact with sodium carbonate, breaks it up and forms a compound with sodium, which is of a colloidal nature, and not diffusible; second, when this sodium compound is treated with an excess of CO_2, it is again broken up slowly, with the formation of sodium carbonate and the original lecithalbumen. His complete theory of what takes place in the gastric mucous membrane is as follows: By the mass-action of the excess of CO_2 formed in the tissue, the NaCl is decomposed, with formation of free HCl, which may diffuse outward to the free surface and inward to the blood, while the Na is held back in the cells, in combination with the lecithalbumen, as a non-diffusible body. Later, after the period of digestion is past, the CO_2 gradually decomposes this compound, and the sodium carbonate formed is passed into the blood, in greater part. Thus he overcomes the chemical difficulty emphasized by Bunge, viz., the curious fact that the acid should pass to the free surface of the stomach, and the alkali, necessarily liberated in the reaction, should take the other path to the blood. To explain the difference in the chemical reactions taking place in the stomach, at rest and during active secretion, he supposes that, in the former condition, owing to the less vascular condition of the stomach and the less active metabolism of the tissue, there is less CO_2 formed, and, therefore, only a minimal quantity of HCl produced. But, during the active condition of the stomach it becomes flushed with blood and the metabolisms are increased, and, therefore, more CO_2 is formed, and a greater quantity of HCl.

The theory does not make very clear why the secondary action of the CO_2, in decomposing the colloidal compound of sodium and lecithalbumen, should only take place after the digestive secretion has ceased to form; that is, toward the end of or after the gastric digestion; although he suggests that the mere colloidal nature of the substance prevents the CO_2 from penetrating into it rapidly.

Chittenden,$^{178}_{\text{v.11,pp.410,436; v.12,pp.12,23,34}}$ with the aid of his students, has published a series of articles, during the year, upon the cleavage products formed in the gastric digestion of various proteids. The researches carry out the general plan of work begun by Kühne and Chittenden, and to which we owe so much of our knowledge of the chemistry of digestion. In the first paper, Chittenden and Smith take up the study of gluten-casein, the chief proteid constituent of wheat, to determine whether the gastric digestion of the vegetable proteids proceeds along the same lines as the digestion of animal proteids. The gluten-casein, prepared according to a method given in detail in the paper, gave, upon elementary analysis, an average composition of carbon, 52.87; hydrogen, 6.99; nitrogen, 15.86; sulphur, 1.17; oxygen, 23.11. Several lots of the material were exposed to a strong, artificial gastric juice, for from five to eight days, at 40° C. (104° F.), and, in some cases, to a subsequent digestion, with fresh juice, for from four to five days. They find that the stages of digestion are essentially the same as in animal proteids. The gluten-casein gives both primary and secondary albumoses or caseoses, before the final conversion to peptone, and they were able to separate out proto-, hetero-, and deutero- gluten caseoses. Elementary analyses of these three substances are given, the most notable difference being the progressive decrease in the percentage of carbon. This fits in well with the view that the caseoses, like the proteoses or albumoses, in general, represent successive stages of hydration. The final yield of peptone was small. A second paper, by Chittenden and Hartwell, takes up the digestion of phyto-vitellin, the crystallized globulin from pumpkin-seed. The crystalline substance was digested, as before, or long periods, with strong, artificial gastric extracts, and they were able to show that with this, also, the digestion results in the formation of intermediate products between the original proteid and the end peptone, and that the intermediate products are similar to those obtained from albumen or fibrin. They succeeded in isolating proto-globulose and deutero-globulose, and made elementary analyses, which gave them the following results:—

	Carbon.	Hydrogen.	Nitrogen.
Vitellin, ...	51.60	6.97	18.80
Proto-vitellose, . . .	51.52	6.98	18.67
Deutero-vitellose, . .	50.42	6.74	18.43
Deutero-vitellose, from a second digestion, . .	49.27	6.70	18.78

The striking points brought out by the analyses are the small difference in composition between the original proteid and the proto-vitellose, and the important difference in the carbon between the deutero-vitellose and the vitellin. This difference is in harmony with the results from other proteids and with the general theory of hydration; but the analyses are particularly interesting in this case because of the supposed special purity of the proteid upon which the experiments were made. In a third paper by Chittenden and Hartwell, they give a *résumé* of some of the past work upon digestion, with some general account of the extent and meaning of gastric digestion. Pepsin in acid solutions is a proteolytic ferment, whose end action has been supposed to be the conversion of proteid to peptone. The conception as to what is peptone has not been distinctly defined, and the term, as generally used, has really included what Kühne and Chittenden have called, formerly, albumoses, and, later, proteoses. But Chittenden has noticed, in his various researches upon gastric digestion, that a comparatively small percentage of real peptone—"bodies not precipitated by ammonium sulphate"—is formed, the preliminary bodies, the proteoses, being the chief outcome of the digestion. To fully test this point was the object of the present paper. Egg-albumen, fibrin, and other proteids were employed and digested for varying periods, and at certain times the percentages of true peptone and of proteoses were determined. Some idea of the results obtained may be derived from the following table, taken from the paper. The percentage was calculated on the weight of dry albumen used.

Time of Digestion.	Neutralization Precipitation.	Proteoses.	Peptone.
42 hours.	6.34 per cent.	63.94 per cent.	29.72 per cent.
69 "	4.90 "	63.77 "	31.33 "
91 "	4.65 "	61.51 "	33.84 "
142 "	4.05 "	53.05 "	42.90 "

The results of the experiments show that, although the amount of peptone formed is greater the longer the digestion is continued, nevertheless, at the end of the most vigorous digestion, a considerable portion of the proteid remains in the form of proteoses, apparently indicating that the chief action of the pepsin is the formation of the intermediate products. The authors hesitate to apply this fact to natural gastric digestion without making further experiments. Trypsin, on the other hand, quickly changes proteid to true peptone; and, taking advantage of this, Chittenden and Goodwin have, in a fourth paper, prepared peptones from myosin, and submitted the results to elementary analysis. The average composition of four products was: carbon, 49.26; hydrogen, 6.87; nitrogen, 16.62; sulphur, 1.16; oxygen, 26.09. The figures give another illustration of the fact brought out in the other papers, that the peptones differ markedly from the mother-proteid in the lower percentage of carbon. Analyses of myosin itself gave a composition of: carbon, 52.79; hydrogen, 7.12; nitrogen, 16.86; sulphur, 1.26; oxygen, 21.97. In a fifth paper, Chittenden and Solley$^{178}_{\text{v.12,p.23}}$ take up the digestion of gelatin. In the books, gelatin is usually stated to be acted upon by the proteolytic ferments, and to be converted into a gelatin-peptone. The authors find that, in the main, this is true. Pure gelatin, submitted to the prolonged action of artificial gastric juice, is changed first to intermediate products resembling the proteoses of proteid digestion, and which, therefore, by analogy, may be called gelatoses. They succeeded in splitting the gelatoses into two groups,—proto-gelatose and deutero-gelatose,—but were not able to get any body corresponding to hetero-proteose. Evidence was also obtained that some true gelatin-peptone, not precipitable by ammonium sulphate, was formed in the peptic digestion, but it was in such small quantities that it could not be separated for analysis. With trypsin similar results were obtained, except that a larger proportion of true peptone was formed. The digestion of gelatin, therefore, proceeds along parallel lines with the digestion of proteids. The authors call attention to one distinct and probably important difference. In proteid digestion the deutero-albumose, and still more the peptone, differ from the mother-proteid in the much lower percentage of carbon in the molecules. In former experiments by Chittenden upon the digestion of elastin he had shown that the elastoses produced did not differ from the mother-elastin in the percentage of carbon to the same extent. The same was found to be true of the digestion of gelatin, as shown by the following figures:—

	C.	H.	N.	S.	O.
Gelatin, ...	49.38	6.81	17.97	0.71	25 13
Deutero-gelatose (gastric digestion),	49.23	6.84	17.40	0.51	26.02

This would seem to indicate that in the digestion of albuminoids the chemical changes are not so extensive as in the digestion of the proteids.

A second paper, on the digestion of gelatin, by Klug,[246] B.46,p.100 gives, unfortunately, results quite different from those reported by Chittenden. Like Chittenden, he used the finest white gelatin, thoroughly washed, to remove all soluble salts, but on elementary analysis he got the following figures: carbon, 42.75; hydrogen, 7; nitrogen, 15.61; oxygen and sulphur, 34.64. The reactions of the gelatin are described and compared with the general reactions of proteids. When treated with artificial gastric juice or pancreatic juice the gelatin was readily digested, especially by the pancreatic extracts. For some reason, not explained, extracts of the ox's stomach were found to have no digestive action at all on the gelatin. The action of the gastric and the pancreatic ferments was found to be different in one respect,—the former converted the gelatin into intermediate products, similar in a general way to the albumoses, which, therefore, he named glutoses; the latter gave, as the end result of its action, glutoses and true gelatin peptones. He succeeded in demonstrating two stages in the glutoses formed,—proto- and deutero- glutose, the reactions of which were closely allied to those of the similar albumoses. Elementary analysis of the glutoses gave the following figures: carbon, 40.06; hydrogen, 7.02; nitrogen, 15.86; oxygen and sulphur, 37.06. From this analysis, it would seem that there is an important diminution in the percentage of carbon compared with the mother-gelatin: a result just the reverse of that obtained by Chittenden. After the most active digestion of the gelatin by gastric juice there was always an undigested residue, which, upon analysis, was found to contain more of carbon and nitrogen than the glutoses. This substance seems to be comparable to antalbumid formed in the digestion of albumens, and he gives to it the name of apoglutin. He advances the hypothesis that, during digestion, the glutose molecule is split off from the gelatin, leaving the substance apoglutin. From nutrition experiments carried out upon dogs, he is able to corroborate the previous statements of Voit and others, that gelatin fed with non-nitrogenous foods is not capable of keeping an animal in nitrogen equilibrium. When solutions of glutoses or of gelatin peptone were injected into the circulation, they were promptly excreted by the kidneys, from which we may infer that the gelatin peptones during absorption from the alimentary canal, like the albumen peptones, undergo an alteration of some kind in transit through the intestinal wall. He adopts the view that the alteration is caused by the action of leucocytes, and then indulges in a rather unwarranted speculation to the effect that the leucocytes may transport the absorbed glutoses, possibly already metabolized back to gelatin, to the connective tissues, there to be used as constructive material.

A recent study of the movements of the stomach and intestines in the dog, by Rossbach,[69, Apr. 9] gave him results in some respects different from those heretofore obtained. He found that when the stomach is full the movements are at first feeble but soon increase in strength, and are maintained for from four to eight hours. But these movements are confined to the pyloric end, the fundus showing no contractions beyond the fact that it maintains a condition of feeble tone. The movements begin about the middle of the stomach, and spread in the form of a wave toward the pylorus, where they stop abruptly; and the contractions may be so strong as to obliterate completely the lumen of the stomach. Cold and hot water, if not taken in too great quantities, favor the movements, but large draughts of cold water, like narcotics, retard the contractions. During the four to eight hours of gastric digestion, the pylorus remains closed in consequence of the tonic contraction of the sphincter-like musculature. Toward the end of digestion the sphincter is relaxed, and the contents of the stomach are ejected into the duodenum in a number of spurts. Only after this happens does the duodenum begin its contractions, but its movements, once started, continue as long as any chyme is received from the stomach. When the movements of the stomach finally cease, the duodenum likewise comes to rest. In a second portion of his paper Rossbach gives a careful description of the intestinal peristaltic movements in the human being, based on observations made upon a woman whose abdominal walls were so thin that the intestines could be seen plainly. The alternately large and small waves of contraction are accurately described, and the various conditions which influence the character of the movements are enumerated It was found, for instance, that the peristaltic movements become distinctly weaker and more sluggish toward evening. Draughts of cold water or of coffee start up active peristalsis, the influence of the coffee being especially marked. Intense hunger was found also to bring on strong intestinal peristalsis.

Two researches have appeared during the year directly bearing upon the physiology of the pancreas. In one, by Abelmann,[2041; 2/J] in which experiments were made upon dogs, the pancreas was removed wholly or in part. After complete extirpation, it was found that about 44 per cent. of the proteid ingesta was absorbed, the rest escaping. Of the carbohydrate food, under the same circumstances, about 60 to 80 per cent. was absorbed. The most marked effect was upon the fats. Dogs without a pancreas seemed to be unable to absorb any of the fat when it was given as ordinary neutral fat. When, however, it was given in the form of a natural emulsion, milk, about 53 per cent. underwent absorption. The importance of the pancreatic secretion upon the absorption of fats, which has long been recognized, is shown in a most striking way by these experiments. In a paper, bearing upon the same subject, by Minkowski, he suggests that the value of the pancreatic secretion in the absorption of fats may depend upon the fact that it is able to produce what may be called a natural emulsion, like that of milk, which, in some points, as in its behavior toward acids, differs from artificial emulsions made with alkaline soaps.

In a second paper, upon the same subject, by Hedon,[410 p.788] he states, in the beginning, that he has been able to corroborate completely the recent observation by von Mering and Minkowski, that when the pancreas is completely extirpated glycosuria results though, if even a small portion of the pancreas remains in the abdominal cavity, this result does not appear. He found that the extent of the glycosuria varied greatly with different animals, because of secondary conditions, which could not be determined. For example: In some animals the amount of sugar in the urine was large, and was present continually, the animal soon falling into a cachectic condition, which ended in death. In others the glycosuria was less intense, and was intermittent; for intervals of several days the urine might be free from sugar, and this was followed by a period of glycosuria. In others, still, the glycosuria was present only when the animal was given carbohydrate food; a diet of pure proteid would make this symptom disappear at any time. Finally, in some animals the glycosuria was very slight, even upon a diet of carbohydrates, but the malnutrition of the animal was marked, and the cachexia made rapid progress. He calls especial attention to this last case, as it seems to indicate that the glycosuria may not be the chief evil resulting from complete extirpation of the pancreas,—the condition of general malnutrition may be the more important and serious result, though no explanation of why it occurs can be offered at present.

It is well known that extracts of pancreas from some animals —ox, pig, sheep—will curdle milk like the rennin of the gastric secretion. Edkins[178 v.12,p.193] has made a study of this action with reference to its cause and to its effect upon the casein. His main conclusion is, that the curdling is due to the action of a specific ferment, distinct from the proteolytic ferment. With strong extracts of pancreas the action of the trypsin upon the casein is so rapid that the intermediate effect of the rennin ferment is not readily recognized; the action of the proteolytic ferment masks that of the rennet ferment. For this reason, the presence of the latter is more easily recognized in weaker extracts. It would seem from this, that in the normal pancreatic secretion no less than four distinct enzymes are present,—the proteolytic, the amylolytic, the fat-splitting, and the rennet. Even when pancreas extracts cause no actual curdling of milk, *i.e.*, the conversion of casein to tyrein, or of caseinogen to casein, according to the nomenclature adopted, they often produce such a change in the casein that upon subsequent boiling it coagulates readily. This effect has been designated by Roberts as the metacasein reaction, and the same term is used by Edkins. One might think of the metacasein as an intermediate product between the casein as found in the milk and the curd or tyrein, which is the normal end-product of the rennet ferment. But Edkins states that if the metacasein is prepared pure and then submitted to the action of the rennin it does not curdle. Hence he concludes that it is not an intermediate product on the way to form tyrein, but an end-product closely similar to tyrein, and formed instead of it under certain conditions not fully known. Like previous observers, Edkins finds that pure solutions of casein cannot be made to coagulate with rennin unless calcium salts are present. But the soluble modification of casein produced by the ferment when the calcium salts are absent is apparently a different thing from the metacasein described in the paper.

Several other papers have appeared during the year, treating of casein and its properties, which may be spoken of in this connection. One, by Halliburton,$^{178}_{v.11,p.448}$ contains a re-investigation of the proteids of the milk. He calls the proteid which constitutes the curd of clotted milk casein, and its soluble antecedent in normal milk caseinogen. The caseinogen may be obtained from milk by precipitating several times with magnesium sulphate, and finally, to get rid of the excess of salt, by acetic acid. The precipitate is then washed with dilute acetic acid, and dissolved in lime-water. The process is repeated, if necessary. The solution in lime-water will clot upon the addition of rennin, provided calcium phosphate is added. The solution is not coagulated by heating, though neutral solutions may become opalescent at 50° C. (122° F.), the opalescence disappearing upon heating. If neated to 80° C. (176° F.), the opalescence becomes permanent, though no actual precipitate is formed. In acid solutions the same phenomena may be obtained, though at lower temperatures, 40° and 70° C. (104° and 158° F.), respectively. After precipitation of the milk by magnesium sulphate there remains, in solution, in the whey, a lactalbumen, similar in its general properties to serum-albumen. In feebly acid solutions it coagulates at 77° C. (170.5° F.). Saturation with ammonium sulphate will precipitate it completely from its solutions, but saturation with sodio-magnesium sulphate or double saturation with sodium chloride and magnesium sulphate will precipitate it incompletely, one property in which it differs from serum-albumen. The lacto-globulin, stated by Sebelien to occur in milk, was not found by Halliburton. He thinks that Sebelien used a double saturation with sodium chloride and magnesium sulphate, and got a precipitate of lactalbumen, which he mistook for a globulin. With reference to the presence in milk of a peptone or a peptone-like substance, which has been so frequently asserted and denied, Halliburton, like others, found no trace of such a body in fresh milk, but in sour milk or whey there was an abundance of a body which gave the red biuret reaction and reacted toward sodium chloride and nitric acid like the albumoses, and, therefore, in all probability, belonged to that group of proteids. This substance seemed to be formed along with the lactic acid during fermentation. The caseinogen of milk when acted upon by rennin gives an insoluble curd of casein, but, as in the similar case of the conversion of fibrinogen to fibrin, the entire molecule of caseinogen is not transformed to casein. At the moment of coagulation a new proteid is split off from the caseinogen molecule, and may be found in the whey, and for which the rather unfortunate name of whey-proteid is suggested. In its properties, this proteid seems to resemble closely the original caseinogen from which it is derived, so that it stands in an intermediate position between the globulins and the derived albumens. With reference to the classification of the caseinogen, since it bears many resemblances to alkali-albumen, and at the same time gives some of the reactions of globulins, Halliburton thinks that it must be placed in an intermediate class by itself.

Ringer$_{\text{v.11,p.464; v.12,p.164}}^{178}$ reports a number of experiments upon the properties of casein and caseinogen, using the terms with the meaning proposed by Halliburton. He finds that the casein of the curd is easily soluble in lime-water, and may be precipitated from its solutions by the addition of calcium chloride. The amount of calcium chloride depends largely upon the temperature. At 70° C. (158° F.) much less will be required than at the room-temperature, and, if the precipitate has been produced at 70° C. (158° F.), simply lowering the temperature will cause the precipitate to redissolve. The clot formed by the calcium chloride has all the appearance of the curd produced by rennin from milk. In the normal curdling of milk the caseinogen seems to be first changed to casein by the ferment, and this, in turn, is clotted or precipitated by "its combination with a lime-salt." The precipitation seems to be assisted, moreover, by the presence of milk-sugar, and retarded by potassium and sodium salts. The author enumerates a number of differences in reaction between casein and caseinogen with reference to their precipitation by lime-salts, and the effect of inorganic salts and milk-sugar on the precipitation. In his second paper he reports the following additional observations: A solution of caseinogen will curdle with calcium chloride and rennet when phosphates are not present in the solution. The two steps in the curdling of caseinogen by rennin, namely, the conversion to casein and the subsequent precipitation by the lime-salts, may be separated as follows: A solution of caseinogen is taken, free from lime-salts, and to it is added some rennin, free from lime-salts also. After some time this solution may be boiled, to destroy the ferment, and when so treated gives no precipitation. But if at any time lime-salts, calcium chloride, are added to this solution it curdles at once. Ringer believes that in the curdling the casein forms an insoluble precipitate with the calcium.

Ringer$^{178}_{\text{v.12,p.170}}$ and Sainsbury show that the salts of lime, as well as the salts of the allied metals, strontium and barium, facilitate the heat-coagulation of the proteids of serum. Potassium and sodium salts in serum also aid the heat-coagulation, but, when present in company with the lime-salts, they tend to hinder the favoring influence of the latter. Whether or not heat-coagulation of proteids, like the ferment coagulation in blood and milk, is dependent upon the presence of lime-salts in solution, it was not possible for them to determine, since they were not able to get an albumen free from lime-salts. It forms an interesting problem for future investigation.

In connection with the recent work upon casein and its properties, it is well to bear in mind that casein has been shown by Kossel[2042, June 30] to belong to the group of compound albumens like hæmoglobin ; that is, it is composed of a simple proteid in combination with a phosphorus-containing group. This is indicated by the effect of peptic digestion. Digestion of casein with pepsin results in the splitting off of a nuclein-like body.

Shore[178, v.11, p.528] studies the fate of peptone after injection into the blood or into the lymphatic circulation. When injected at once into the blood-vessels, it is excreted through the kidneys. If the renal vessels are tied, it passes from the blood into the lymph and thence back again to the blood *via* the thoracic and right lymphatic ducts. In making this circuit the peptone must pass through some of the lymphatic glands; nevertheless, it is found in apparently undiminished quantities in the thoracic duct, indicating that if the leucocytes have any converting action upon the peptones, it is not of a very striking character. He tried also injecting a solution of peptone directly into a lymphatic vessel of the leg, at a point where colored injections had previously demonstrated that it must pass through a lymphatic gland on its way to the thoracic duct. Nevertheless, the peptone was found unaltered in the duct. Similarly, peptones made to circulate through the spleen came through unaltered. By exclusion, the author is led to agree with the opinion of Heidenhain, that the transformation undergone by peptones during absorption through the intestinal walls, is not effected by the leucocytes, as taught by Hofmeister, but most probably by the action of the columnar epithelial cells.

Continuing his previous work, reported in the ANNUAL, 1890-1891, upon the digestion of fats, Dastre[410, p.186] reports a number of new experiments bearing upon the same subject. In one series, made upon dogs, the bile was led off from the body by a biliary fistula, and the animal was fed upon a diet containing a known quantity of fat in the form of milk. The proportion of fat absorbed under these circumstances varied from 57 to 65 per cent. of the total quantity fed. Examination of the fæces proved that the unabsorbed fat was eliminated entirely as neutral fats. In the absence of bile, the splitting up of the neutral fats in the intestine seems to be less active. In a second paper, Dastre[410, p.711] attempts to determine the effect of variations in the amount of fat in the food upon the percentage of fat-absorption, the variations being within physiological limits. He finds that by diminishing the amount of fat in the food of a young and healthy dog by 16 per cent., the amount of fat which escaped absorption was diminished by 9 per cent. Apparently, the utilization of the fat food is more perfect with small than with large amounts. Of the fat which passed through the intestines unabsorbed in these experiments, by far the larger portion was present in the fæces in the shape of neutral fats, but a certain proportion of free fatty acids, acid soaps, and soaps of the alkaline earths, was also found.

One of the most important papers of recent years upon fat-digestion we owe to Munk and Rosenstein.$^{20}_{\text{B.122,p.230}}$ The authors were given an opportunity to examine and experiment upon a girl suffering from elephantiasis, in whom the varicose lymph-vessels of the left leg had burst through the skin, forming a lymph-fistula. When fasting, the lymph that exuded was clear; but, after meals, it became milky, proving that in some way the intestinal chyle-duct communicated with the left lumbar lymphatic trunk, and that the chyle absorbed from the intestines in large part reached this latter vessel, and escaped through the fistula, instead of entering the thoracic duct. After a fast of twenty hours, the lymph was of a gray or greenish-yellow color, almost free from opalescence, of an alkaline reaction, a specific gravity of 1016 to 1023, and coagulable upon standing. Upon analysis, this lymph was found to contain from 3.66 to 5.62 per cent. of solids, and about 3.5 per cent. of albumens. The paraglobulin varied from 0.698 to 1.055 per cent., and the serum-albumen from 2.818 to 2.489 per cent. The first set of experiments made upon the patient had for its object to determine the time necessary for the absorption of the fat from the intestines. The experiments were made partly with a fluid fat—olive-oil—containing 6.4 per cent. of free, fatty acid, and partly with solid mutton-fat. Of the total amount of fat fed, 60 per cent. of olive-oil and 55 per cent. of the mutton was recovered through the fistula. With reference to the time of absorption, the fat began to be perceptible in the lymph after the second hour. The maximum percentage was found from the fifth to the eighth hour,—the maximum for the olive-oil falling between the fifth and the sixth hour, and for the mutton between the seventh and eighth hour, showing that the more solid fat was absorbed with greater difficulty. After the maximum was reached, the percentage of fat in the lymph fell, rather rapidly, to the eleventh to the thirteenth hour. In previous work upon lower mammals, Munk had shown that when fatty acids are fed to an animal they are absorbed as neutral fats; the authors utilized the opportunity to make a similar experiment upon human beings. The patient was fed first upon a fat-free diet, the day previous to the experiment, and was then given 17 grammes (4⅛ drachms) of erucic acid, the lymph being collected for fourteen hours afterward. Chemical examination proved that in this lymph there was free acid to an amount equal to 2.5 per cent. of oleic acid; but that the remainder of it was in the shape of neutral fat, erucin, the glycerin compound of erucic acid. Quantitatively, the erucin collected accounted for about 45 per cent. of the total amount fed. The experiment shows that in the act of absorption through the intestinal walls fatty acids may be combined synthetically with glycerin, by some means as yet unknown. Another point, of equal interest, investigated upon the patient was, the absorbability of fats with high melting-points, or, rather, with melting-points above the temperature of the body. The usual belief has been that such fats escape absorption almost entirely, though in some previous work with Arnschink, Munk had shown that this belief is not well founded.

The experiments in this case were made with spermaceti, which is a substance similar to the fats, being a compound of palmitic acid and cetyl-alcohol, as ordinary palmitin is a compound of palmitic acid with glycerin,—a tertiary propyl-alcohol. After keeping the woman on a fat-free diet for some time, she was given 20 grammes (5⅛ drachms) of spermaceti, the melting-point of which is 53° C. (127.5° F.). The collected lymph became milky after the fifth to the sixth hour. Examination of the total lymph collected in twenty-four hours gave them data from which they reckoned that about 15 per cent. of the spermaceti had undergone absorption. Upon analysis, the astonishing fact was developed that the fat absorbed was not spermaceti, but neutral palmitin. It follows, from this, that the portion of spermaceti absorbed must have been broken up in the intestine into cetyl-alcohol and palmitic acid, and that the latter was combined with glycerin during its absorption. They subsequently made experiments with extracts of pancreas, to test its power of splitting up the spermaceti, and found that with pigs' pancreas a limited amount—about 19 per cent.—was acted upon in this way. In animals to which spermaceti was fed, the unabsorbed portion was recovered from the fæces as unaltered spermaceti. They infer, therefore, that the inability of animals to make use of spermaceti and similar bodies with high-melting points depends chiefly upon the fact that the intestinal secretions are unable to split off the fatty acids. Whatever portion is split off will be absorbed as a glycerin compound,—a neutral fat. Similar experiments were afterward carried out with other foreign fats, both upon the patient and upon dogs.$^{320}_{\text{Phys. Ab., p. 881, '90}}$

In a series of similar investigations upon the absorption of the fatty acids, Munk$^{320}_{\text{Phys. Ab., p. 114, '90}}$ made the interesting discovery that, if the non-volatile fatty acids are injected into the blood, they cause the death of the animal, apparently by an action on the heart, since the blood-pressure and pulse fell steadily to the lethal point. This effect was obtained upon rabbits, after an injection of from 0.11 to 0.13 gramme (1$\frac{7}{10}$ to 2 grains) of oleic acid per kilo (2$\frac{1}{2}$ pounds); upon dogs, after an injection of from 0.20 to 0.30 gramme (3$\frac{1}{10}$ to 4$\frac{3}{5}$ grains) per kilo. If the volatile acids were used, *e.g.*, butyric, an injection five to seven times as great had no slowing effect upon the heart. When the non-volatile acids were injected into the portal vein, a much greater quantity was necessary to produce the same effect,—as much as 0.806 gramme (12$\frac{1}{3}$ grains) per kilo of animal. Incidentally, Munk states that the blood-pressure in the portal vein of the dog equals 26 to 30 millimetres of mercury. In addition to the action of the non-volatile acids or their soaps upon the heart, the author states that, like peptones, they prevent, to some extent, the coagulation of the blood, and have something of a narcotic influence. From these facts, we can understand the necessity of the fatty acids being combined with glycerin during absorption through the intestinal wall.

Under the direction of Ludwig, a number of experiments have been made by Slosse$^{276}_{\text{July '90}}$ to determine whether the liver takes part in the normal production of urea. The experiments were made upon dogs. The cœliac axis, the superior and the inferior mesenteric arteries, were ligated, thus cutting off completely the circulation from the liver, as well as from the spleen, intestine, and pancreas. The animals died, shortly after the operation, with symptoms of poisoning. In the urine, both albumens and albumoses were found, and quantitative examinations showed a marked diminution in the urea and the ammonia. As far as the experiments go, they indicate that, in the final formation of urea, the liver probably takes an important, though not an exclusive part.

It is known that bile injected into the blood increases the secretion of bile from the liver, but it is a question whether the strange bile so introduced is directly eliminated, or whether it simply acts as a stimulus to the liver. Wertheimer$^{410}_{\text{p.724}}$ brings forward a neat experiment to show, as far as the bile-pigments are concerned, that the liver has the power of eliminating an excess directly introduced into the blood. In the bile of sheep and oxen McMunn has shown that there is a pigment—cholohæmatin—which gives a spectrum with four distinct bands. Wertheimer injected some of the bile from a sheep or an ox into the blood of a dog, and was able to discover the cholohæmatin within a few minutes in the bile secreted from the liver. In the light of this property of the liver, it may be supposed that the bile-pigments in the intestine which undergo absorption may be re-eliminated directly in this way. How far this property applies to the biliary salts was not investigated.

Lépine and Barral,$^{3}_{\text{Jan.21,Feb.25,Mar.25,Apr.29}}$ in a number of communications, have called attention to the disappearance of sugar when mixed with blood outside of the body and allowed to stand for some time. They propose the theory that an unorganized ferment—glycolytic ferment—is present in the blood, which causes the sugar to disappear. This view is borne out by the fact that if the blood is first heated to 55° C. (131° F.) it loses its power of destroying the sugar. According to their conception, the glycolytic ferment is a normal constituent of the blood, and is probably derived from the pancreas as an internal secretion; that is, a secretion into the blood instead of into the excretory duct of the gland. As has been stated (p. 33), removal of the pancreas seems to be followed by glycosuria; the theory proposed by Lépine and Barral gives a simple and direct explanation of this effect, since, under these circumstances, the glycolytic ferment of the blood would be absent. They made a number of determinations of the glycolytic power of the blood in various diseases, and obtained some interesting results. In diabetic patients the glycolytic power of the blood, compared with normal blood, was only as 3 to 25. If the theory of the authors could be accepted, it would offer a simple explanation of the immediate cause of glycosuria. But in a second paper, upon the same subject, by Arthus,[410] he arrived at conclusions which seem to negative their general theory. He corroborates the general statement that sugar, added to blood, quickly disappears, and goes on to prove that it is due to the presence of an unorganized ferment. He found that the effect was the same if the access of bacteria to the blood was prevented, if the blood was made laky by water, and in serum deprived of its red corpuscles by standing. The last fact seemed to show that the red corpuscles took no direct part in the reaction. Freshly-formed fibrin had a distinct glycolytic action, indicating that this ferment, like fibrin ferment, may be carried down from liquids by voluminous precipitates. As to the origin of the ferment, he is of the opinion that it does not exist in normal blood, since, if blood is kept in contact with a normal surface during the experiment—kept, for instance, in a test-tube made of a jugular vein—the sugar is not affected. So, blood prevented from coagulation by the addition of oxalates, and in which the corpuscles were then rapidly separated from the plasma, showed no glycolytic action. He concludes that the ferment must be formed in the blood after it is shed, and must be derived from the histological elements other than the red corpuscles. In blood permitted to settle so as to form three layers—red corpuscles, white corpuscles, and serum—the glycolytic power of the middle layer was found to be the strongest, and this was taken as an indication that the glycolytic ferment, like the fibrin ferment, is derived from the white corpuscles and blood-plates.

To determine the route by which iron is eliminated from the body, Gottlieb[83 B.15, p.371] has made a number of experiments upon dogs, in which the iron was injected both into the blood and subcutaneously. The dose was varied from 100 to 200 milligrammes, and the fæces were afterward collected for a number of days and examined quantitatively for iron. When injected subcutaneously the iron is eliminated very slowly, as shown by the following experiments:—

Dog weighing 8.95 kilos, injection of 100 milligrammes of iron.

Iron eliminated in fæces in 28 days, ...	183.1 milligrammes.
Normal elimination of iron in 28 days, ...	86.2 milligrammes.
Balance, representing the excess injected, .	**96.9 milligrammes.**

After intra-venous injection of the iron, examination of the intestinal contents showed a large percentage of iron, averaging about 70 per cent. of the amount injected. Examination of the liver after the blood had been carefully washed out showed a remarkable increase in its iron contents. The iron in the liver seemed to be separated out in combination with an organic body. The question next arose as to the way in which the excess of iron thus separated out in the liver got to the intestines. The first suggestion, that it passed by way of the bile, was apparently negatived by the fact that it was present always in the bile, only in minute traces. The author is of the opinion that the iron is not carried off by the bile, but that it is eliminated by the epithelial cells of the intestinal canal. Dastre$^{410}_{p.136}$ also reports some experiments upon the elimination of iron through the liver. His determinations were made upon a large dog, weighing 25 kilos, in which a permanent biliary fistula had been established. The bile was collected for periods of twenty-four hours, and examined for iron. He gives the mean of his determinations at 0.94 per cent. The amount eliminated showed the greatest irregularities, in spite of the fact that the diet was regular and normal. He is led to infer, therefore, that the iron in the bile depends upon the activity of the processes of hæmatopoiesis and hæmatolysis, rather than upon the character of the food. The total quantity of iron eliminated in twenty-four hours varied from 2.34 milligrammes to 0.09 milligramme per kilo of animal.

An interesting contribution to the chemical history of uric acid in the body is made by Horbaczewsky.$^{1008}_{B.12,p.221}$ In previous work, to which he refers at the beginning of this paper, he had proved that from spleen-pulp, by means of putrefaction, with or without subsequent oxidation, either uric acid or xanthin (hypoxanthin) might be obtained. Though one could not be changed to the other, he was convinced that they were both derived from the same mother-substance, formed, probably, during the putrefaction. Furthermore, his experiments indicated that the mother-substance was formed in the lymphoid tissue of the spleen, and, since it has been shown that xanthin may be derived from nuclein, and that uric acid may be derived from nuclein prepared from the spleen, he concludes that the mother-substance of the two bodies prepared from the spleen by his method is probably a nuclein. Using the same methods, he has been able to obtain uric acid from other tissues, and especially from those rich in lymphoid elements. In addition, when nuclein was fed to animals and to men, he was able to demonstrate that the amount of uric acid in the urine was increased. To account for these facts, he makes the hypothesis that the leucocytes of the body furnish the mother-substance or nuclein from which the uric acid is formed, as one of the end-products of their metabolic changes; in fact, we may take the uric acid as representing the extent of disassimilation among the leucocyte elements of the body. In support of this view, he turns naturally to the study of uric acid in cases of leucocytosis. The positive and negative results of this examination may be briefly stated as follows: After a rich flesh diet there is a temporary increase in the leucocytes of the blood and a corresponding increase in the amount of uric acid eliminated. As a supplement to this observation, he finds that in those exceptional individuals in whom a rich flesh diet does not cause a digestion leucocytosis there is likewise no increase in the uric acid. Quinine, which causes a diminution in the leucocytes of the blood, is characterized also by a diminished elimination of uric acid. Atropine gives a similar result. Administration of pilocarpine, which is followed by an increase in the number of leucocytes, is attended also by a marked rise in the uric acid of the urine. On the other side, antipyrin and antifebrin, though they bring on a distinct leucocytosis, yet diminish the amount of uric acid eliminated. The author is not able to give a satisfactory explanation of this fact, which is hostile to his theory. Among pathological conditions, leucæmia, acute fevers, and pneumonia, all of which are accompanied by increased consumption of the tissues, are characterized also by a rise in the amount of uric acid in the urine.

In connection with the above paper, it is interesting to call attention to some work by Chittenden,$^{178}_{\text{v.12,p.280}}$ upon the influence of alcohol upon the proteid metabolisms. The experiments were carefully made upon dogs. The animals were fed upon a known diet for a period of days, during which the total nitrogen of urine and fæces was determined as well as the urea and uric acid; this was followed by an alcohol period of eight or ten days, in which the animal was given comparatively large doses of alcohol, reaching as much as 2.5 cubic centimetres of absolute alcohol per kilo (2½ pounds) of body-weight. He found that, as far as the amount of proteid metabolisms was concerned, it was but slightly affected, the diminution being no more than would be expected if the alcohol was oxidized, and, like a non-nitrogenous food-stuff, protected an equivalent amount of nitrogenous tissue from consumption; to that extent he is willing to admit that it acts as a food. The most significant result of the experiments was the discovery that during the alcohol period the uric acid eliminated was markedly increased, even to the extent of 100 per cent. over the normal. It would have been very interesting, in connection with Horbaczewsky's hypothesis, to have determined whether there was any corresponding increase in the leucocytes of the blood.

MISCELLANEOUS.

In several recent papers, Brown-Séquard and D'Arsonval[410, pp. 491, 508] give an account of a number of experiments made upon the injection of glycerin extracts of glands and other tissues into living animals. Following the lines indicated in the well-known experiments of Brown-Séquard upon the injection of extracts of the testes, which were so thoroughly exploited in this country, these newer experiments have for their basis the theory that each gland, in addition to its secretion into its duct, gives something also to the blood, which may be called its internal secretion, and which is useful or necessary in preserving the normal healthy state of the organism. Upon the removal of the gland the internal secretion fails, and the result, *e.g* , extirpation of the thyroids, may be serious or even fatal. The authors believe that in such cases injection of an extract of the same gland from healthy animals will be sufficient to remove the dangerous symptoms. To emphasize the importance of the internal secretion, they cite the recently discovered facts that in the extirpation of the thyroids a fatal result may be obviated by leaving a small portion of the gland in the body, and in extirpation of the pancreas, the gylcosuria and malnutrition, which would otherwise appear, may be prevented in a similar way. They hope that important therapeutical applications of this idea may be made in the future,—that, for instance, in cases of exophthalmic goitre, injections of extracts of thyroid glands may prove beneficial; in cases of Addison's disease, injections of extracts of the adrenals, and so on. The present paper is chiefly taken up by a description of the technique of the preparation of the extracts. Injections of extracts of the sexual glands may be made upon most animals without danger, even if no precautions as to sterilization and filtering have been taken. But extracts of other glands, unless properly sterilized and filtered, usually cause the death of the animal. Death, in such cases, did not seem to come from septicæmia, but from toxic substances in the extracts. Since boiling

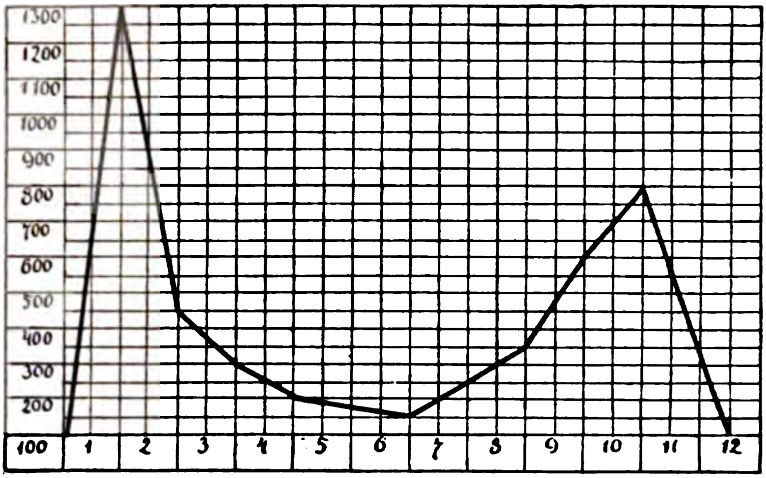

FIG. 1.—CURVE OF DEPTH OF SLEEP OF GIRL 8 YEARS AND 8 MONTHS OLD.
(*Jahrbuch für Kinderheilkunde.*)

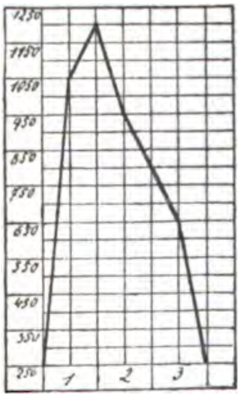

FIG. 2.—CURVE OF DEPTH OF SLEEP OF INFANT 28 DAYS OLD.

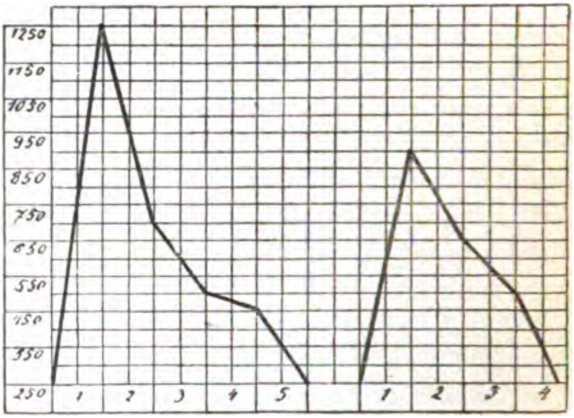

FIG. 3.—CURVE OF DEPTH OF SLEEP OF CHILD 9 MONTHS OLD.
(*Jahrbuch für Kinderheilkunde.*)

injured the extracts, they accomplished the sterilization by means of CO_2, under a pressure of 40 atmospheres. The liquids were then filtered through specially prepared filters, made chiefly from a preparation of gelatinous alumina, baked at 1500° C. (2732° F.). Prepared in this way, the extracts may be injected without danger, and in a future paper they expect to give the therapeutical results of such injections.

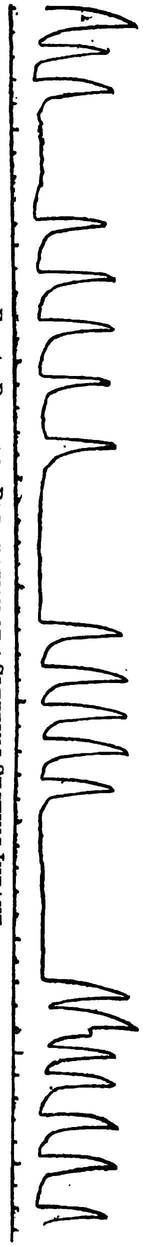

FIG. 4.—PAUSES IN RESPIRATION OF A SLEEPING SUCKING-INFANT. (*Jahrbuch für Kinderheilkunde.*)

Our knowledge of the physiology of sleep is so limited that any careful study of its phenomena is especially welcome. Czerny$_{B.33,H.1,2}^{366}$ gives an account of a number of experiments, made chiefly to determine the normal curve of sleep of children, and its variations under physiological conditions. As in similar experiments upon adults, the depth of sleep was measured in terms of the intensity of the sensory stimulus necessary for awakening. Czerny used the induction-current as a stimulus, and applied it to the arms through dry electrodes, the wires from which were so arranged as to interfere as little as possible with the movements of the child. The author gives at the beginning of his paper an interesting table of the minimal strength of primary current sufficient to produce a just perceptible sensation in children of various ages while awake. The sensibility of the skin measured in this way was found to be least at birth, greater during the first year, and then nearly constant until about the sixth year, when it became distinctly more acute. The curve of sleep obtained from young children is shown in Fig. 1. It differs from the curve of the adult, as given by Mönninghoff and Piesbergen, chiefly in the size of the second rise of the curve, which reaches its maximum at the ninth or tenth hour. In the adult this second maximum is much less distinct. In nursing-infants the average length of a "nap," according to the author's observations, is three hours. The curve shows only a single rise, the apex of which is reached between the first and second hours, after which the curve rapidly falls. (Fig. 2.) Czerny thinks that the second maximum in the curve for young children is explained by a study of the curve of infants of the age of 9 months. At this age (see Fig. 3) we have two curves, separated by a waking hour, the wakening being caused by the hunger-sensations of the child. With increased age this hunger-need becomes less marked, and, though sufficient to diminish the depth of sleep, does not awaken the child. In the two successive sleeping periods of Fig. 3 the smaller size and shorter duration of the second curve seems to be the immediate result of the shortly preceding sleep of the first curve. The author gives curves to show the effect of the midday nap upon the night-sleep, the chief effect being a diminution in the depth but not in the duration of the sleep. One interesting result of his experiments was the proof that at the two maxima of the sleep-curve there was a marked increase in the perspiration. The author seems to connect this with an automatic regulation of the depth of sleep, since the perspiration means increased heat-dissipation, which, as he has shown, tends to diminish the depth of sleep, and thus may prevent the sleep from passing into a condition bordering upon narcosis. Pulse tracings and curves of respiration at the different hours of sleep are also given in the paper. With reference to the respiration, the curves show that in sleep the breathing is slower and more shallow, the expirations being prolonged. One very striking curve of respiration from an infant is reproduced (Fig. 4), to show the curious grouping of the respiratory movements at this age during sleep. It recalls the curves which have been obtained from hibernating animals.

GENERAL INDEX.

BY D. BRADEN KYLE, M.D., AND N. I. McCARTHY,

PHILADELPHIA.

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THERAPEUSIS.

ABORTION.

PROPHYLAXIS. *Opium* with *brom.*, hot appl. to abdom., and rest in bed. *Tinct. opii* gtt. xv in warm water per rect. ev. hr. ii. I-12. *Morphia* gr. ¼ (0.016 grm.) with *atrop.* gr. 1-60 (0.0018 grm.), subcutan. inject., ii. I-12. *Tinct. viburnum prunifolium* gtt. xxx ev. 3 hrs., v. A-141.

IN HÆMORRHAGE, douche *pot. permang.* pt. j (½ litre) and *alum* ℥j (31 grms.); pack vagina with *iodof.* gauze, ii. I-13. *Iron-quinine chlor.* 10 drops of 10% sol. ev. 1 to 2 hrs., v. A-91.

IN DEPRESSION AFTER HÆMORRHAGE, *strychnia* gr. 1-60 (0.0018 grm.) with *ergot* ♏xx (1.3 grms.), ii. I-12.

FOR RETAINED PLACENTA, Sanborn's expect. meth., ii. I-13. Detach and remove by finger or polyp. forceps, ii. I-13.

ABSCESS, MAMMARY.

Phytolacca, v. A-113. Antisep. treat.; *hydrog. perox.*, ii. K-14.

ACNE.

Wash parts daily with hot water, then appl. sol. *hydrarg. bichlor.*, 1 pt.; *spts. rectif.* (90 %), 50 to 100 pts.; *aq. destil.*, 100 to 150 pts., iv. A-50. *Oriental lotion;* Brocq's formula, iv. A-50. *Resorcin oint.*, i. I-12. *Ichthyol*, intern., gr. xv (0.97 grm.) a day; local., comb. with *lanolin*, *zinc oint.*, or *glycerin*, 5 to 50 %, v. A-86.

ACNE NECROTICA.

Local appl. of *sublimate* (1 to 1000), and at night appl. *emp.* de Vigo, iv. A-1. *Curette* parts; appl. *cautery*, as *electric needle* or *zinc chlor.*, iv. A-1. *Sulphuris præcip.*, *saponis viridis*, āā ʒij (7.78 grms.); *petrolat.*, ℥ss (15.00 grms.). M. Sig.: Apply with friction at night, and wash off in the morning. iv. A-1.

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THERAPEUSIS.

ACTINOMYCOSIS.

Gautier's electro-chem. treat.: cauterize with *stick silver*; inject. *tuberculin*; begin with gr. 2-13 (0.01 grm.), increase to gr. iii 4-5 (0.25 grm.).

SURGICAL. Remove tumor, disinfect, iii. L-10.

ALCOHOLISM.

***Morphia inject.*; inhala. of *chloroform*; rectal feeding, iv. I-11.**

CHRONIC. *Chloralamid*, v. A-48. *Hyoscine*, gr. 1-300 to 1-100 (0.00022 to 0.00065 grm.), v. A-79. *Strychnia*, iv. I-16; v. A-104. Keeley cure, iv. I-17, 18. *Kefir*, v. A-10.

IN DELIRIUM TREMENS, *pot. brom* gr. xxx (1.94 grms.) ev. 2 hrs. *Morphia* gr. ¼ (0.016 grm.) at bed-time; withdraw *all* stimulants. iv. I-12. *Chloralamid.*, v. A-49. *Nitrous ox. gas*, v. A-102.

FOR TREMOR, *hyoscine* gr. 1-100 (0.00065 grm.) twice daily, ii. D-31.

ALOPECIA.

Wash scalp for 10 min. with *soap*, hot water, and finish with cold; wipe dry. Rub in sol. *bichlor. mercury*, 1 to 900 (eq. pts. water, *glycerin*, and *eau-de-Cologne*). Rub in *naphthol* sol.: *naphthol*, 1 pt.; *absolute alcohol*, 200 pts.; then with pomade composed of *acid salicyl.*, 2 pts.; *tinct. benzoin*, 10 pts.; *neat's-foot-oil*, 100 pts.; continue daily for 6 wks. iv. A-50.

ALOPECIA AREATA.

***Chrysarobin* ʒss-j (1.97 to 3.89 grms.) to *lanolin* ℥j and *oil*. Sig.: Appl. local.; remove loose hairs around patches. iv. A-10. *Mercury perchlor.*, gr. ij to v (0.13 to 0.32 grm.); rectif. *spt. of wine*, ʒj (3.37 grms.); *oil turpentine*, ʒvij (23.63 grms.). M. Sig.: Appl. local. Intern. *pilocarpine*, gr. 1-6 to 1-4 (0.011 to 0.016 grm.), or, hypoderm., gr. 1-10 to 1-6 (0.0065 to 0.011 grm.). iv. A-11. *Iron, quinine, cod-liver-oil, phosphorus*, intern., iv. A-11. *Chrysarobin* gr. xx to xl (1.30 to 2.59 grms.), to ℥j of *ointment* or comb. with *salicyl. acid* gr. x to xv (0.65 to 0.97 grm.) to ℥j. Sig.: Appl. local. iv. A-11. If severe, shave scalp and appl. *acetic acid* with eq. pts. *chloroform* and *ether*, iv. A-11. *Besnier's* formula As a stimulating lotion, oil of *eucalyptus* and *turpentine* (eq. parts), ℥ss (15.5 grms.), to *crude petroleum* and *alcohol*, each ℥j, followed by massage. Once a wk., shampoo with *tinct. green soap*. iv. A-12.**

FOR LATER STAGES, *sulph.* and *resorcin oint.* and *salt-water* douche, iv. A-12.

OF BODY, *mercurial* and *tar soaps* and *sulphur baths*, iv. A-12. Local *faradization*; *iodized collodium* (1 to 30); *sol. bichlor. mer.* with *electricity*, iv. A-12.

OF FACE, weak sol. *acetic acid* or eq. pts. *tinct. capsicum*, *tinct. cantharid.*, and *glycerin*. *Jaborandi* and *electricity*. iv. A-12.

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RADIAL. Compress.; if this fail, lig. above and below, and remove injur. part, iii. J-8.

SUBCLAVIAN. Macewen's meth., iii. J-5. Keen's meth., iii. J-6.

TIBIAL. If compression fail, lig. femor. art. in Hunter's canal, iii. J-12.

ANGINA PECTORIS.

GENERAL TREATMENT. *Hydrochlor. morphine*, gr. viij (0.50 grm.); neut. *sulphate atropine*, gr. 2-13 (0.01 grm.); dist. water, ℨiiss (10.00 grms.); M.: 5 drops hypoderm., v. A-35. *Hydrogen perox.*, v. A-77. *Amyl nitrite*, *nitro-glycerin*, comb. with *tonics*, *carminatives*, and *stimulants*, i. B-9. *Arsenic*, i. B-40. During inter. control arterial tension by *nitro-glycerin* or *nitrite amyl*, treat cause, i. B-12.

IF PAIN IS NEURALGIC, galvanism and faradism, v. C-5.

FOR PAROXYSM, the *nitrites*, with *pot. iod.* dur. interval, i. B-12.

TO RELIEVE PAIN, *morph.* or *cocaine*. *Arrest attack* by inhal. *amyl nit.* or hypoderm. inject. *nitro-glycerin*, i. B-12.

IN CHILDREN. *Iron* and *arsenic*, i. B-12.

HYGIENIC TREATMENT. Prevent moral shock, overwork, constipation; no tobacco; vegetable or milk diet, i. B-13.

IF ASSOCIATED WITH DYSPEPSIA, careful feeding and gentle exercise, i. B-10.

ANTHRAX.

Arnoldow's inject.; deep inject. *carbol. acid (5 % sol.)*, *pure carbol. acid* to pustule; apply hot compress.; local applica. of *pud. ipecacuanha*; also internally in gr. iv (0.32 grm.), iii. L-8. *Methyl-violet*, local antisep., v. A-14.

ANTIPYRIN, ANÆSTHESIA BY.

Local. applied to m. m. of nose, pharynx, and larynx; also of cornea, v. A-21.

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APPENDICITIS, PERITYPHLITIS, ETC.

ANTIPHLOGISTIC TREATMENT. Leeches, foll. by ice or Leiter's coil. If cold does not agree, use hot applications. Appl. local. *iodoform collodion*, to which add eq. pts. *tinct. iod.* and *nut-gal's*. To hasten absorption use *sapo viridis*. Intern. *tinct. cinchon. comp.*, *opium*. If necess. for bowels, give *enema*, *comp. licorice-pwd.*, or *Carlsbad salt*. iii. C-94. For pain, *morph.* inject., *mercur. oint.* innunct., poultices, rendered asept. by *boric acid*, and anodyne by *laudanum*; prolonged baths, i. D-15. Nothnagel's meth.; by leeches, ice-bags; Leiter's appar., i. D-13.

INTERNAL TREATMENT. Intestinal antisept.; *salicyl.* and *magnes.*; intest. irrigation twice daily. Bouchard's formula: *sodii bibor.*, *tinct. benzoini*, *spts. camph.*, āā gr. lxxv (5 grms.); aqu. (98° F.—36.7° C.), pts. 1¼ (100 c.cm.). Sig.: One inject. i. D-15. Absol. rest; no long walks nor great efforts dur. convales.; milk diet, yelks of eggs; free evac. of bowels, hot foment., or ice-bags; blisters over tumor, if chronic, i. D-14. During first 24 hours, to prevent perforation, recumb. position; strict diet; constant appl. of moist heat; *opium*. If these fail, laparotomy and remov. of

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THERAPEUSIS.

APPENDICITIS, PERITYPHLITIS, ETC. (*continued*).

appendix. iii. C-89. Keen's meth.; oper. by second and not later than third day of attack. Operation is necess. (1) if there is abdom. pain, most marked in right iliac fossæ, esp. with tenderness over McBurney's point, with nausea and vom.; (2) rigidity of right abdom. wall; (3) fever from 100° F. (37.8° C.) to 102° F. (38.9° C.), which does not yield to medical treat.; (4) if tumefact. and increased resistance, with dullness and poss. fluct.; (5) if œdema of abdom. wall. iii. C-90, 91.

SURGICAL TREATMENT.

IF CHRONIC, WITH PERSISTENT EXUDATE, warm, moist, appl., with massage; purgatives.

IF PYÆMIA IS THREATENED, *quinia*, *salicy. sod.*, and *antipyrin*, iii. C-94.

IF APPENDIX IS PERFORATED, resect., unless prevented by adhesions, i. D-13; iii. C-95.

IF PUS IS FOUND, wash out abscess-cav., resect appendix, invert, use Lembert's sut., pack space between incision and abscess with gauze and *iodoform*, drain by rubber or glass tube, partly close wound. If necess. for drainage, make counter-opening, i. D-13; iii. C-97.

IF RECURRENT, operate during remission, iii. C-98.

IN UNCERTAIN DIAGNOSIS, *opium* and gen. antiphlogistic treat.

IF GEN. PERITONITIS, laparotomy. i. D-12; iii. C-92. Sonnenburg's meth., iii. C-93.

ASTHMA.

Belladonna; *tinct. lobelia*, begin with gtt. xx, grad. increased to ʒiij (11.66 grms.) in 24 hrs; *grindelia robusta*, gtt. xv to xx, i. A-53. Inhala. vapor. *pyridin*; *iod. pot.*, i. A-53. *Chloral* and *belladon.*, night- and bed- time; *tinct. conium*, ʒss (1.97 grms.) ev.

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half hr. for 4 doses. i. A-54. *Hydrogen perox.* in inhaler; *strong coffee*, i. A-55.

For bronchial expectoration, *pilocarpine;* after attack, *iod. pot.*, i. A-55.

For dyspnœa, fumes of *bromohyd.* of *ammon. chlor.* rendered neutral by passing through wash-bottle. i. A-55.

If spasmodic, *nitro-glycerin*, v. A-102, 103. *Euphorbia pilulifera*, gtt. xx to xxx ev. 4 hrs.; may be comb. with *glycerin* or equal pts. fld. ext. *grindelia robusta*. If beginning attack, appl. *cocaine muriate* (5 % sol.) or inhal. *pyridin*, gtt. vj to xij. *Stramonium-leaves* and *nitrated paper* smoked in pipe. If attack is at height, *morphia* hypoderm. During interval, *iod. pot.* for 15 days, then *belladon.* for 15 days. i. A-54. *Aristolochia Mexicana*, v. A-29. *Nitrous ox. gas*, v. A-102. *Oxygen*, v. A.108. *Resorcin*, v. A-120. *Sulphonal*, gr. xv (0.97 grm.), v. A-135.

Bed-Sores.

Aristol, gr. xl (2.59 grms.) to ℥j (31 grms.) of *cosmolin*, v. A-28.

Bladder, Diseases of.

Catheterization of. Before passing cath. inject a few drops 5 to 10 % *sol. cocaine*, v. A-55.

Cystitis, Acute. *Kava-kava*, v. A-93. *Oxalic acid*, gr. xvj (1.04 grms.); *syr. of orange*, ℥j (37 grms.); *dist. water*, q. s. for ℥iv (120 grms.). Sig.: Teaspoonful ev. hr. v. A-108. *Sod. salicyl.* and *colchicum*, i. L-81. Mineral waters, esp. *calcium sulphate*, as Martigny, Vittel, and Contrexéville, i. L-81. *Syr. hippurate of calcium*, 3 teaspoonfuls t.i.d., i. L-81. *Salicyl. acid*, i. L-81. *Sod. salicyl.*, *ext. pichi fld.*, i. L-82. *Rhus aromat.*, ʒij (7.78 grms.); *nux vom.*, gtt. xvj; *acid phos. of calcium*, ℥j (31.00 grms.); *orange-syr.*, ℥j (31.00- grms.). M. Sig.: One fluid drachm (3.75 grms.) ev. 3 hrs. i. L-82.

If retention occur, *ergot*, and electric stimulation in hypogastric region, i. L-84. External urethrotomy, i. L-84.

Chronic. Irrig. twice daily with ½ % sol. *camphoric acid*, v. A-44. Inject. *cocaine*, 5 to 10 % sol., v. A-55. Inject. ʒiij emulsion *iodoform*, v. A-90. Formula for, v. A-91. *Kava-kava*, v. A-92. *Styracol*, v. A-133. *Ichthyol*, v. A-87. *Kava-kava*, fl. ext., ʒj in teacupful lukewarm water, i. L-82. *Ex. pichi fld.*, gtt. xx, xl, to lx, in sweetened water ev. 3 hrs., i. L-82. *Rhus aromatica* and *hydrastis Canadensis; hydrogen perox.*, i. L-82.

Purulent. *Iodof.* inject., i. L-82.

Hæmorrhage.
Dialyzed ergot, gr. xlvj (3 grms.); after hæmorrhage ceases, gr. xxiij (1½ grms.) t. i. d. for three days, v. A-65.

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Cystitis. Irrig. of bladder with *sod. chlor.* ʒj to water Oj (½ litre), foll. by inject. of *black-tea decoc.*, ii. K-14. *Creolin*, ii. F-36. Render urine aseptic by *salol.*, *borate of sod.*, *benz. sod.*, *benz. acid.*, i. L-83. *Salol*, ʒss (1.94 grms.) given sev. days before oper.; intra-vesical douches of *boric-acid water* (3 to 100). Hypoderm. inject. of *morph.* Diuretics, as barley-water, linseed tea. i. L-83.

For pain, *opium*, *chloral*, *pot. brom.*, and *belladon.*, *cocaine*, i. L-83. Local appl. of *boric acid*, *pot. permang.*, Labarraque's sol., *quin. sulph.*, and *nitrate of silver*, i. L-83. Dila. of neck of bladder; establish vesico-vag. fistula, i. L-83. *Helenine* and *arbutine*, 5 granules each, with 2 granules of *aconite*, i. L-84.

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Enuresis. Sänger's meth.: Sims's meth. of forcible dilatation. If bladder is contracted, use massage. ii. H-9. Remove all irritating cause; *atropine*, i. L-85, 87. *Rhus aromatica*, begin with gtt. v and increase to xxv 4 times daily, i. L-86. In anæmic cases, *rhus aromat. fld. ext.*, ʒv (20 grms.); *syr. fer. iod.* and *elix. calisaya*, āā fʒij (60 grms.). M. Sig.: Half teaspoonful 4 times a day. i. L-86. *Antipyrin*, given in the evening, i. L-86. *Tinct. lycopod.*, ♏xx to xl (1.3 to 2.6 grms.) 3 or 4 times a day, i. L-86. *Strychnine* and *hyoscyamine*; *pot. brom.*; cold douches, i. L-87. When there is hyperacidity, *sod. bicarb.*, i. L-87. *Ergotine*; Tienhoven's meth. of treat.; Harkin's meth.; electricity, i. L-87.

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Stone. Litholapaxy. Supra-pubic lithotomy, elevate bladder with Peterson's rectal bag. iii. E-12. Litholapaxy prefer. in children, iii. E-14. Lithotrity; first wash out bladder with sol. *silver nit.*, 1 to 500. Supra-pubic cystotomy. iii. E-14.

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Necrosis.

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Osteomyelitis of Long Bones. Open, curette: early op., iii. H-20. Resect, iii. H-20.

Tuberculosis. Before suppuration occurs, immobilize and compress; if suppu. open, curette: König's op.; Ollier's meth., iii. H-17. Irrig. with *lysol*, 1 to 5 % sol., v. A-93.

Of Joints. *Formic acid; aërotherapy* and *salt-water* baths, iii. L-3. *Lysol*, 1 to 5 % sol,, v. A-93.

Trochanter. Open, chisel, and curette, iii. H-18.

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Encephalocele. Puncturing and excision; Broca's oper., iii. A-11.

Fractures of Skull.

Comp. Comminuted. Trephine and elev., iii. A-37.

Depressed. Trephine' and elevate, iii. A-30, 35.

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Non-Traumatic. Trephine, iii. A-12.

Traumatic. Trephine and remove clots, iii. A-13. Extern., cold by ice-cap, ii. A-18.

Hydrocephalus. Aspiration, iii. A-8. Tap at lowest point in spinal canal; drainage by collared cannula; trephining, iii. A-9.

Microcephalus. Linear craniotomy. iii. A-26.

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Blood and Spleen, Diseases—Frederick P. Henry and Alfred Stengel, ii. E-1.

Blood-serum of Dog, Action — Charles Luzet, v. B-10.

Bones, Anatomy of—Louge, Gulliver, Howes, Humphrey, Hyrtl, Sternberg, Rogie, v. G-1; Lannelongue, Albrecht, Couëtoux, Musgrove, v. G-2; Birmingham, Rosenberg, Bellini, Koganei, E. H. Bennett, v. G-3.

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Brain, Diseases—Landon Carter Gray, W. B. Pritchard, R. C. Shultz, ii. A-1. Abscess: V. Malinowsky, Hill Griffith, Jamieson, Surgeon Turner, Barclay, Grubert, ii. A-28; J. Orne Green, L. Henry, Grubert, Bristowe, Steel, Williamson, L. Russ, B. Silva, Carl Löhmeyer, ii. A-29. Allochiria: Weiss, Obersteiner, ii. A-55. Aphasia and Allied States: Montagu Lubbock, John Wylie, E. W. Holmes, Pascal, Picot, Pick, ii. A-10; Gilbert, Binschwanger, Stacy Wilson, Chevalier, *Revue scientifique*, Klinke, Cramer, ii. A-11; Cramer, Luys, Déjerine, ii. A-12; T. D. Poole, Muehleck, Bernheim, Parisot, ii. A-13; Leube, Grashey, Fogliano, Adler, Ivan Mierzejewski, ii. A-14; Déjerine, Netter, Déjerine, Hale White and Golding Bird, Taylor and Hadden, Perry, ii. A-15; Gutzmann, Küssmaul, Bitot, Chevrin, Behnke, Winckler, Uchermann, Kramer, Thyssen, Bonmaison, Thyssen, ii. A-16; Eulenburg, G. M. Hammond, J. Séglas, Blocq, Charcot, Courtois-Suffit, Charcot, Legrand, Du Saulle, ii. A-17. Complications, Ocular: Perlia, C. S. Bull, iv. B-127; Snell, Jessop, R T. Williamson, Major, iv. B-128; Oliver, Noyes, iv. B-129; Marchand, Norris, Hun, Wilbrand, Weeks, iv. B-130; Story, Boé, Hamilton, Hill Griffith, Spierer, iv. B-131; Peterson, Van Duyn, de Schweinitz, Oliver, iv. B-132; Guinon and Parmentier, Charcot, iv. B-133 Foreign Bodies: Richard Slee, Virgil

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THERAPEUSIS.

BRAIN, DISEASES (*continued*).

TUMORS.

ANEURISM, ARTERIO-VENOUS. Rest; low diet, Oj (½ litre) of liquid per day; digit. press. carot. art.; full doses of *potass. iod.*; ligation of common carot. art., iii. A-4.

ANGIOMA, MENINGEAL. Trephine and remove, iii. A-3.

CYST, ALBUMINOUS. Trephine, open cyst and drain, iii. A-7.

GLIOMA. Trephine and remove, iii. A-5.

SARCOMA, SPINDLE-CELLED. Trephine and remove, iii. A-6; ii. A-30.

TRAUMATISMS. Operat. treat., ii. A-21.

WOUNDS, GUNSHOT. Extract foreign body; trephine and drain, iii. A-42.

BRIGHT'S DISEASE.

Ichthyol, v. A-87. *Nitro-glycerin*, gr. 1-100 (0.00065 grm.) t.i.d., v. A-103. *Lactate strontium* ʒiss to iiss (6 to 10 grms.) daily, v. A-132.

DIET. Milk, carbohydrates; during intervals of acute symptoms, white meats, fish; vegetable diet; eggs; absolute milk diet, 4 qts. (4 litres) per day, i. L-48, 53. Grape diet; skimmed-milk diet; koumyss; beer; light wines. Rest in bed. i. L-48, 49. Mild exercise; flannel under-clothing, i. L-48, 49. Lancereaux's meth. treat., i. L-50. Large amts. of water with *digital.*, i. L-51. Peritoneal inject. of sterilized water, i. L-51. To diminish albuminuria, *strontium lact.*, ʒiss (6 grms.) per day, i. L-51. Milk diet, i. L-108. Water acidulated with *muriat. acid.* Small doses *corros. sub.* (*Creolin*, fʒvj (23.33 grms.); *Glycerin*, fʒvj (29.83 grms.); *mucilage of tragacanth.*, fʒvj (29.83 grms.); *orange-flower water*, to f℥vj (180 grms.). M. Sig.: Dessertspoonful to tablespoonful, thrice daily; best taken in milk. i. L-52. *Sod. bicarb.* and *bismuth carb.* several times daily, with esp. care to clothing and warmth, i. L-52. Tepid or hot baths, fol. by friction; cold baths i. L-48. *Alcohol*, in moderate quant., i. L-50.

EPISTAXIS. *Milk diet*, iv. D-20.

IN CHILDREN, protect from cold by inunctions, i. L-50. *Alkaline* drinks, i. L-50.

IN EARLY STAGE, *digitalis*, i. L-50.

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THERAPEUSIS.

BRIGHT'S DISEASE (*continued*).

COMPLICATIONS.

DYSPNŒA. *Nitrites, digital., strophant., nux vom.* or *strych., morphine,* i. L-53.

HIGH VASCULAR TENSION. *Chlor. of gold* and *sod.* and *iodid. of manganese,* by hypoderm. medication, i. L-52. *Nitro-glycerin,* i. L-50.

SCANTY URINE. Dry or wet cups over region of kidney; purgatives, *croton-oil; calomel,* i. L-50, 51. Diaphoretics, as *neutral mixt. pilocarp.,* or *jaboran.;* hot-air baths, i. L-50.

BROMIDROSIS.

Aristol combined with *boric acid,* app in powd form, v. A-26.

BRONCHITIS.

Hydrochlorate quinine in eq. pts. *glycerin* and *water,* inject., i. A-9, 10. *Caffeine* subcutan. inject.; inhaln. *hydrogen perox. sol.* 1 to 10 pts. in 100, long contin., i. A-10. *Acetanilid,* gr. viss (40 centigrms.) t.i.d.; *thymol, mercuric chlor.,* i. A-10.

TO STIMULATE EXPECTORATION, *cocillaña, pilocarpine,* or *apomorphine,* i. A-10. *Apomorphine* gr. j (0.065 grm.) to ℥j (37 grms.) lard or lanolin, appl. to chest at night; *apocodeine,* gr. j (0.065 grm.) in pill 3 or 4 times a day, i. A-11. *Anemonine,* v. A-13. *Chlorphenol inhal.,* v. A-53.

CHRONIC. *Eucalyptol,* ♏v to x (0.32 to 0.65 grm.) ev. 4 hrs., v. A-66. *Nitrous ox. gas,* v. A-102. *Mustard* sinapisms, v. A-100. Subcutan. inject. *nascent oxygen,* v. A-108. *Resorcin,* v. A-120.

TUBERCULAR. *Iodoform* in pill form or hypoderm.; *terebene; ammon. salicyl.,* i. A-11. *Camphorated oil,* hypoderm., ♏ xv (0.97 grm.), v. A-43. *Cocillana, fld. ext.,* ♏ xxx to lx (1.87 to 3.75 grms.) ev. 2 to 4 hrs., v. A-56.

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BURNS.

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CANCRUM ORIS.

Bichlor. mer., 1 to 1000, local app., v. A-97.

CARBUNCLE.

Ichthyol, gr. xv (0.97 grm.) a day; *calcium sulphide*; Riedel's meth., iii. L-6. Locally, 10 % *chloral hyd.* in *glycerin* and *water*, by means of absorbent cotton, iii. L-6. *Ichthyol* comb. with *lanolin*, *zinc oint.*, or *glycerin*, 5 to 50 %, v. A-86.

CEPHALALGIA. (See HEADACHE.)

NERVOUS. *Menthol*, gr. x (0.65 grm.) in hot whisky, v. A-94. *Oxygen*, v. A-109.

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STENOSIS. Cotton-wool plugs covered with *iodof.* and *boric acid*; Purslow or Hegar's dilat.; Philip's meth. of dilat., ii. F-9.

AUTHORS QUOTED.

BROMOFORM—S. Solis-Cohen, Charles W. Earle, C. Binz, E. Sachs, v. A-41; Mennikendam, Isersohn, Zeil, Binz, v. B-10.
BROMOL—Rademaker, v. A-41.
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BRYONIA ALBA—Mankowsky, Huchard, v. A-42.
BURNING, DEATH BY—Sir William Jenner, iv. J-14.

CACTINA, CEREUS GRANDIFLORUS—Frederick W. Sultan, O. M. Meyers, v. B-10; Boinet and Boy-Teissier, v. B-11

CACTUS GRANDIFLORUS — P. Watson Williams, Boy-Toissier and Boinet, v. A-42.

CAFFEINE—Schiavardi, Sée, Semmola, Marconi, Fraenkel, Schroeder, Stahl, Eloy, Huchard, Gempt, Bach and Strauch, Schultze, v. A-43.

CAMPHOR—Alexander, v. A-43; M. B. Cochran, v. A-44.

CAMPHOR MONOBROMIDE — W. F. Curryer, C. C. Vanderbeck, v. A-44.

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CANNABIS INDICA—J. B. Mattison, C. W. Suckling, S. L. D., v. A-45.

CANTHARIDES—Wolfert, v. A-45; Devoto, Maragliano, Cantu, v. A-46.

CANTHARIDIN, G. Coen, v. B-11.

CAPSICUM—W. S. Cline, v. A-46.

CAPULINCILLO, RHAMNUS HUMBOLDTIDIANA—Fernando Altamirano, v. B-11.

CARBOLIC ACID—Delbet, R. L. Patterson, Theodore G. Wormley, A. Frankenburger, v. A-46. POISONING BY: Cygan, iv. J-23; Schleicher, Greenway, iv. J-24; Rigby, iv. J-25.

CARBON DIOXIDE—Gréhant, F. Spallita, L. Finazzi, v. B-12.

CARBONIC ACID, ANÆSTHESIA BY—Wiesendenger, iii. P-19; Kümmel, iii. P-20.

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FOR IRREGULAR RESPIRATION, remove *chlorof.* cap at once, iii. P-12.

FOR VOMITING AFTER ANÆSTHET., irrig. stomach with *soda sol.*, ½ to 1%, iii. P-14; v. A-52.

CHLOROSIS.

Iron. *Phospho-fer.* contains 1½ gr. (0.10 grm.) of *phosph. iron* in 1 tablespoonful; *phospho-fer-calcique* contains 4-5 gr. (0.05 grm.) *phosph. iron*, and 3 4-5 grs. (0.25 grm.) *phosph. calc.* in 1 tablespoonful. Rest, with clysters for the bowels. *Iron* and *arsenic*, ii. E-6.

IF DYSPEPTIC, *hydrochlor. ac.* after each meal, and reduced *iron* or *malate*, *tart.* or *cit.* If these fail, *albuminate* or *peptonate*, *ferrugin. waters*, or hypoderm. administration. *Ferri sulph.* gr. j (0.065 grm.) t. i. d. for a wk., then gr. ij (0.13 grm.) for 10 days, then incr. to 9, 10, or 12 grs. (0.58, 0.65, or 0.78 grm.) daily. ii. E-6.

CONSTIPATION, *aloes ext.*, ii. E-6. *Ferri sulph.*, gr. ij (0.13 grm.); *Potass. carb.*, gr. j (0.07 grm.); *tragac. glycerite*, q. s. to make 1 pill. *Ammon. cit. of iron*, 18¾ grs. (1.20 grms.); *aq. destillata*, *laurel-water*, āā ʒi⅓ (5 grms.). Sig.: Inj. hypoderm. at first 2-7 gr. (0.02 grm.), increased to 1 4-5 grs. (0.12 grm.). ii. E-7. *Pyrophosphate*, *citrate*, and *citro-ammon. pyrophosphate of iron* in 5% sol. and in 46 grs. (3 grms.) doses, subderm. inject.

AUTHORS QUOTED.

CARBONIC MONOXIDE, POISONING BY—Cramer, iv. J-21; R. Hoffmann, iv. J-22.

CARBUNCLE—Evan Powell, Spohn, Riedel, iii. L-6.

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CASTOR-OIL—H. Meyer, v. A-47; Buchheim, Hans Meyer, v. B-12.

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CHINALDINE—Emilio Comessatti, v. B-14.

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CHLOROSIS (continued).

Copper arsenophosphate in 2 pills of 1-6 gr. (0.011 grm.) each before meals; *mint-water* with *hydrochlor. acid* after meals; *tr. nux vom.* betw. meals. Hot baths and venesection. ii. E-7. *Aristolochia Mexicana*, ʒj (3.89 grms.) powd., or tinct. 30 to 40 drops (1.87 to 2.50 grms.), v. A-29. *Camphorated-oil*, hypoderm., v. A-43. *Sulph. iron and magnes.*, ℥ij (7.78 grms.); *chloroform-water*, q. s. ℥vj (180.00 grms.). Sig.: f℥ss (15 grms.) t. i. d. v. A-91. Genestelle mineral springs, v. D-19.

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VOMITING AND DIARRHŒA. Wash out stomach, fol. by rest for 24 hrs.; *Barley-* or *lime- water* as diluents, ii. M-6. *Cinchona*; *lactopeptine* and *bism. subnit.*, gr. j (0.065 grm.) in pwd. ev. hr., i. E-14. *Arsenite of copper*, gr. 1-100 (0.00065 grm.) in ℥iv to vj of *aq.*; M.: teaspoonful ev. 10 min. during first hr., v. A-32. *Bromol*, gr. 1-12 to 4-17 (0.005 to 0.015 grm.), v. A-41. *Resorcin*, v. A-120.

CHOREA.

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IF RHEUMATIC, *chloral*, exercise; mild cold baths, ii. C-60.

AUTHORS QUOTED.

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CHLORATE OF POTASSIUM—F. Forchheimer, Thomas R. Evans, G. A. Fackler, v. A-49; Landerer, Wohlgemuth, v. A- 50.

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Chyluria.

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Club-Foot.

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Narcosis. Panas's and Magitot's rules for admin.: First spray part with ether. iii. P-17.

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To remove dark color, *sol. hydrarg. perox.*, pts. xx–xl; *vaselini*, pts. xx; *lanolini*, pts. x; M; appl. local., iv. A-49. If complicated with pustules and papules, *oint.*, *sulphur* or *sublimate*, iv. A-49.

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Cholera—Gilbert and Girode, i. D-27; Finkler and Prior, i. D-28. Epidemiology: *Abstract of Sanitary Reports*, v. E-39; Zavitziano, Saleb Soubhy, v. E-40.

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THERAPEUSIS.

Condyloma (Verruca Accuminata).

Cauterise with *plumbi ox.*, gr. iv (0.26 grm.); *sol. potas. caust.* (33%), ad f℥ij (60 grms.). M. Sig.: Shake well before using. iv. A-48.

Constipation.

Chronic. *Pulv. ipec. comp.*, gr. x (0.65 grm.) at night, with *turpent. stupes* to abdom., foll., if necess., by enema in morn.; appl. of gr. xlvj (3 grms.) of *pul. boric acid* to rectal mucosa, or by insufflation, i. D-5. *Magnes. sulph.*, ℥ij (62 grms.); *glycerin*, ℥ij (75 grms.); *ol. terebinth.*, ʒiv (19.25 grms.); *aqua*, ℥ij (60 grms.). Sig.: Enema. i. D 6. Rectal inject.: Porter's formula, v. A-11. *Aloes*, in small doses; Wiesbaden's formula, v. A-13. Fl. ex. *cascara sagrada*, gtt. x, t. i. d., v. A-47.

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Club-Thumb—L. Monnier, iii. G-16.

Cocaine, Anæsthesia by—Paul Reclus, Panas and Magitot, Schleigh, Satterwhite, iii. P-17; Broughton, Whistler, Ricketts, Myrtyle, Bettelheim, Cotter, Hueber, Ficano, Reclus, Dombrowski, iii. P-18; A. L. Elberman, iii. P-19. **Physiological Action**: Edward T. Reichert, v. B-18; Gley, v. B-19; Wasserzug, E. Poulsson, v. B-20; Ehrlich, v. B-21. **Therapeutic Uses**: José Sigarroa, Wm. H. Humiston, v. A-53; M. L. Racine, G. Sée, Andrew Fullerton, P. Mannheim, R. S. Hamilton, Acconi, H. Hallopeau, A. Lutaud, v. A-54; R. Troquart, P. de Pietra Santa, Mariani, W. Spencer Watson, E. Spencer, Edward F. Willoughby, v. A-55; Schell, Brunner, J. L. Irwin, Paul Reclus, v. A-56.

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OF DENTITION. *Camphor monobromide*, gr. ij to iij (0.13 to 0.19 grm.) ev. 2 hrs., v. A-44.

CROUP.

MEMBRANOUS. *Chloroform* by inhala. *Sulph. ether*, 3 parts; *acet. ether*, 2 parts; *menthol*, 1-10 part. Sig.: Inhale 3 drops. *Pilocarp. mur.*, gr. 1-12 (.0054 grm.) hourly. *Argent. nit.*, gr. xviij (1.10 grms.) to ℥j (30 grms.), appl. locally. *Ammon. hydrochlor.* as heart stim. and to soft. memb. *Hydrarg. bichlor.*, gr. 1-6 to 1 (.011 to (.065 grm.) in 24 hrs., with *sulphur* locally and intern. i. J-17. *Calomel.* gr. ij (.13 grm.), then gr. j (.65 grm.). ev. hr., with *paregor.* to check purg. Intubation. i. J-18; iv. G-3. Tracheotomy, i. J-18; iv. G-2. *Chloroform*, v. A-52. *Oxygen*, v. A-108. *Steam-vapor of vinegar*, v. A-142.

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CONVALLARIA MAJALIS—Manuel S. M. Bustamonte, v. A. 57.

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DIABETES INSIPIDUS—POLYURIA.
Phenacetin, v. A-111. *Belladonna* and *opium* or *valerian* as nervous sedative. *Iron, quinine, electricity, turpentine, ergot, jaborandi, hydrotherapy*, and *antipyrin*. i. L-98. *Antifebrin* and *antipyrin*, i. L-99.

DIABETES MELLITUS.
Creosote gr. iii 1-10 (20 cgrms.), afterward gr. iv 3-5 (30 cgrms.), increased to gr. vi 1-5 (40 cgrms.) daily. *Arsenic*. i G-31. *Sol. salicyl* and antidiabetic diet; *ergot; sulphonal*, ʒiv (2 grms.) daily; *antipyrin*, i. G-32. *Arsenic brom.*, gr. $\frac{1}{4}$ (0.016 grm.), i. G-33. For pronounced glycosuria, with hyperæsthesia, weakness of limbs, and mild convulsive seizures, *codeia* with antidiabetic diet, i. G-32. Gluten-bread, tea and coffee, i. G-34. *Codeia* and *morphia*, comb. with restrict diet of Cantani and *alk. waters*, as *Vichy, Vals, Carlsbad*, and *Colbi*, i. G-36. Dujardin-Beaumetz's meth of treat., i. G-34, 35. *Carbonate of lithium*, gr. v (0.32 grm.) in glass of alkaline water after breakfast and dinner; to each glass add gtt. ij *Fowler's sol. Antipyr.* gr. xv (0.97 grm.) in cup of black coffee. i. G-35. *Fowler's sol.* with *tinct. calumba*, v. A-30. *Hydrogen perox.* comb. with *codeine*, Richardson's formula, v. A-77. *Ferric brom.* gr. iij to v (0.19 to 0.32 grm.), v. A-92.

FOR GANGRENE, antiseptic and antidiabetic treat., i. G-26. In average cases, with or without azoturia, *jambul semen. pulv.*, gr. cl to cccxx (9.92 to 20.74 grms.) in 24 hrs., with regulat. diet, i. G-30, 31. *Valerian*, ʒss (2.0 grms.), v. B-39. Carbonated baths, v. D-19. Genestelle min. springs, v. D-19.

FOR MOUTH-WASH. *acid. borici*, gr. clxxv (11.24 grms.); *acid. phenici*, gr. xv (0.97 grm.); *thymol*, gr. iv (0.27 grm.); *aquæ*, q. s. ad f℥xxx (900.00 grms.). Add *tr. anisi*, fʒiiss (0.16 grm.); *ess. menth. pip.*, gtt. x (0.66 grm.); *spts. rectif.*, f℥iij (81.00 grms.); *cochinille*, q. s. for tinting; M.; sponge body with tepid water foll. by friction with rough towel. i. G-35.

IF GOUTY DIATHESIS, alkaline treatment. i. G-19.

COMPLICATIONS.
COMA. If due to cardiac weakness, avoid excess. exercise and depressants; give nutritious and easily digest. food, mod. amt. of *alcoh.*, fresh air. Purgatives. i. G-39. Reynolds's meth., i. G-40. Transfusion salt water, v. A-130, 131.

PRURITUS. Intern., *opium, chloral*. Exter., acid lotions, oils; flannel comp. satur. with *sol. atropine* 1 to 500, cover. with oiled silk. *Cocaine oint.* (1 to 30 vaselin). *Boracic acid* or *vineg.* lot'ns, fol. with *pwd. borax* or *innunct.* of *glycerole* of *carbol. acid.* i. G-39.

DIET. Eggs, fowls, game, mollusks, cheese, fish. All green legumes except beets, carrots, and turnips. Fats, sardines in oil, smoked herring, bacon, and lard, goose-fat, rillette, ham, pork and kraut, kaviar. i. G-35. Cantani's diet, i. G-36. Milk diet, i. G-37. If hepatic disturbance, alkaline waters, i. G-38.

DIARRHŒA, IN ADULTS.
Enema of *Ems salts*, then in 1 hr. an enema of *tannin* (1 %), or *quinine* (1 to 1000) and retain 15 min. Intern., *quinine*, i. D-1, 2.

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DIABETES MELLITUS (*continued*).
Leva, Eichhorst, i. G-28; Leyden, i. G-29. NATURE AND ETIOLOGY: Lancereaux, Boutard, Rendu, Collins, Moritz, i. G-2; Moritz, i. G-3; Lancereaux, Sée, Semmola, Thiroloix, Hedon, de Dominicis, i. G-4; von Mering, Minkowski, de Dominicis, Lépine, i. G-5; de Renzi and Reale, François Cartier, i. G-6; Gallois, Lépine, Sansoni, von Mering, Minkowski, ANNUAL 1891, i. G-8; Lépine, Arnaud, Barral, i. G-9; Lépine, Barral, Arthus, i. G-10; Lépine and Barral, Gaglio, von Mering, Minkowski, Sansoni, i. G-11; de Renzi and Reale, Lépine and Barral, Lannois and Lemoine, Mollard, Toralbo, i. G-12; Reynolds, Cartier, Colasanti, Kratschmer, i. G-13; Seegen, Mallet, Savage, i. G-14; Dewees, Magelson, Schmitz, He, Gerhard, Landenberger, Finkler, Kohlman, i. G-15; Kállay, i. G-16. SEMEIOLOGY: F. Hirschfeld, i. G-16; Honigmann, Riegel, Rosenstein, Salemonsen, i. G-17; Auché, Ziemssen, Hoesslin, Blau, Pryce, Leyden, Eichhorst, Althaus, Charcot, Bussard, Vergely, i. G-18; Lange, Auché, i. G-19; Hirschberg, i. G-20; Magitot, i. G-21; Bazy, Pousson, Kühl, i. G-22. TREATMENT: Villy, Dujardin-Beaumetz, i. G-30. Posner, Lewaschew, Audubert, Cuthbertson, i. G-31; Sympson, Lépine, Allen, Witherspoon, Casarelli, Pousson, i. G-32; Arnozan, Armaignac, Venot, Saint-Philippe, Cullen, Catillon, Dujardin-Beaumetz, i. G-33; Duhomme, Dujardin-Beaumetz, i. G-34; de Renzi and Reale, Bufalini, Pavy, ANNUAL 1891, Chéron, Paul, Lewis, Purdy, i. G-36; Carles, i. G-37; G. Van Abbott and Sons, Wright, Ireland, Fremont, Kopf, Castro, i. G-38; E. Besnier, Schmitz, i. G-39; Reynolds, i. G-40.

DIADERMIC MEDICATION—J. von Boeclaere, L. Guinard, v. A-59.

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THERAPEUSIS.

Diarrhœa, in Adults (*continued*).

Chronic. *Inf. red-rose petals*, a tumblerful twice or thrice daily for adults, and a tumblerful or cupful in divided doses daily to a child under 5 yrs., i. D-2. Rest and massage with warmth of body, i. D-3. General massa. once daily, and, as strength and weight of pat. increase, twice daily, i. D-3. *Aristolochia Mexicana*, ʒj (3.89 grm.) *pwd.* or *tinct.*, gtt. xxx to xl (1.87 to 2.50 grms.), v. A-29. *Arsenite of copper*, v. A-31.

Tubercular. *Arsenite of copper*, v. A-32.

Diarrhœa, Infantile.

Diet. Boiled milk; *lactic acid*. If epidem., disinfect room. i. E-6. Meat-broths, meat-juice, white of egg; cream well dil., i. E-9. Sterilized milk, ii. M-5. Barley- or lime- water add. to milk, ii. M-7.

Prophylaxis. Proper food; sterilized milk; hygienic precautions. i. E-8. Wash out stomach, i. E-13. Use milk kept in air-tight flasks, i. E-9.

If vomiting, weak brandy and water; chicken-broth, or barley-water. i. E-9.

Medical Treatment. *Bism. sub. nit.*, gr. x (0.65 grm.) ev. 2 hrs. for child 1 yr. old. *Arsenite copp. Carbol. acid. Resorcin, naphthalin, mer. bichlor.* i. E-9. *Castor-oil; calomel*, gr. 1-10 or 1-6 (0.0065 or 0.011 grm.) ev. half to one hr. until gr. j has been taken, fol. with *bismuth* or acids and intest. antisept., i. E-10. *Opium*, i. E-10, 11.

In marasmic child, *salol*. gr. iiss (0.16 grm.) to gr. xx to xxx (1.30 to 1.94 grms.) daily, i. E-11. *Acetanilid*, gr. ij to iv (0.13 to 0.26 grm.) for child from 1 to 2 yrs.; repeat ev. 4 hrs. comb. with whisky, i. E-11.

For pain, *antipyrin*, i. E-11.

For hæmorrhage and bloody stools. *oil of turpentine*, comb. with *opium* or *bism.* *Zinc sulphocarbol.* gr. ¼ (0.016 grm.) to gr. iv to v (0.26 to 0.32 grm.), i. E-12. *Liq. hydrarg. perchlor.*, ♏xij (0.72 grm.); *pot. iod.*, gr. ¾ (0.049 grm.); *chloral. hydrat.*, gr. j (0.065 grm.); *aquam*, ad ʒj (3.75 grms.). Sig.: Dose for child 6 mo. old, teaspoonful ev. 4 hrs. i. E-12.

For vomiting, *creasote*, gtt. ⅛ ev. 30 min. in water or *elix. pepsin.*; *creasote* with *bism.* or *sug. milk*, i. E-12. *Carbol. acid* and lime-water; small doses Fowler's sol., i. E-13. *Antipyrin*, v. A-20. Small doses *calomel*, fol. by *arsenite copper*, 6 to 8 tablets gr. 1-100 (0.00065 grm.) each, in ½ glass water; teaspoonful ev. 15 min. for 6 or 7 doses, v. A-33. *Camphor monobromide*, gr. ij to iij (0.13 to 0.19 grm.), v. A-44. *Chloroform-water*, v. A-52. *Creolin enemata*, ʒj (3.89 grms.) to Oj (½ litre), v. A-59. *Resorcin*, teaspoonful ev. 2 hrs. of gr. iv 3-5 to vii¾ (0.3 to 0.5 grm.) *resorcin* in 100 c.cm. (℥iiiss) of menstruum, v. A-121.

Diphtheria.

Prophylaxis. Antiseptic gargles. Disinfect *clothing*, *furniture*, and *pat.* All articles used by patient should be boiled in *sod. carb.*, ℥j (31 grms.); water, pt. j (480 grms.). Disinfect clothing by heat; wash bedstead and walls of room with *corros. sub. sol.* i. J-4. Grancher's method, i. J-4. *Acidi carbol.*, *ol. eucalyp.*, āā ℥j (31 grms.); *spts. tereb.*, ℥viij (240 grms.). Sig.: Add 2 tablespoon. to 1 qt. water and keep simmering in room. i. J-5. Smith's mixt. and method of using, i. J-5, 6.

Treatment. *Ferri chlor.*; *potass. chlor.*, i. J-7. *corros. sub.* intern. *Sod. benz.*: for child under 1 yr., 105 to 120 grs. (7 to 8 grms.) daily; bet. 2

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Digitalis—G. Sée, Petresco, Edimbourg, James K. Crook, R. M. Ellyson, C. S. Bradfute, v. A-60; Bayet, v. B-27.

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THERAPEUSIS.

Diphtheria (*continued*).

and 3 yrs., 120 to 150 grs. (8 to 10 grms.) daily; over 7 yrs., 150 to 225 grs. (10 to 15 grms.) daily. *Sod. benz.*, 5% sol. as gargle and nasal irrig. i. J-8.

Local Treatment. *Hyd. perox.* as spray or garg. i. J-9. *Hyd. perox.* with *cor. sub.*, i. J-10. *Acetic-acid* spray. *Ac. salicyl.*, gr. 7¾ to 15½ (0.50 to 1.20 grms.); *alcohol*, q. s. ad sol. et add. *glycerin*, ℥i⅓ (40 grms.); *infus. eucalyp.*, ℥ij (60 grms.). M. Sig.: Spray, brush, or gargle. *Aquæ*, *glycerin*, āā ʒv¼ (20.0 grms.); *ac. salicyl.*, gr. vii⅔ (0.50 grm.); *spts. recti.*, q. s. ad sol. M. Sig.: Use locally. *Ac. salicyl.*, 62 gr. (4 grms.); *Spts. rectif.*, 1¼ oz. (40 grms.); *aq. destil.*, ℥ii⅔ (80 grms.). M. Sig.: Locally. *Ac. salicyl.*, gr. xvss (1 grm.); *aquæ*, Oij (960 grms.); *spts. rectif.*, ʒv⅓ (20 grms.). M. Dissol. acid in alc., add water. Sig.: Irrig. fauces. i. J-11. *Sod. hyposulph.*, ʒij (7.78 grms.); *aquæ*, ℥viij (240.0 grms.). Also, *ac. hydrochlor. dil.*, ʒiij (11.66 grms.); *aquæ*, ℥viij (240.0 grms.): M.; tablespoon. of each in atom., bottle, and spray immed. i. J-12. Gaucher's meth. *Bor. ac.*, ʒj (3.75 grms.); *sod. bor.*, ʒij (7.50 grms.); *aq.*, Oss (¼ litre). M. Sig.: Irrig. nostrils. i. J-12. Seibert's method; Phillips's method, i. J-13. *Acid. asepticum*, in strength of 50%, v. A-3. *Alcohol*, v. A-6, 7. *Antipyrin*, v. A-21. *Bromol-glycerin sol.*, 1 to 25, v. A-41. *Echinacea Angustifolia*, v. A-64. Ice intern. and extern., comb. with antiseptics; *chlorate pot.*, v. A-86. *Pot. iod.*, gr. ss to iij (0.032 to 0.19 grm.) ev. 2 to 4 hrs.; also appl. to throat. *Stimulants* and *quinine*, v. A-89. *Oxygen*, v. A-108. *Resorcin*, v. A-119. *Salicyl. sod.* comb. with *chlorate of sod.*, v. A-124. *Salicyl. acid*, gr. vii¾ to xvss (0.50 to 1.0 grm.); *alcohol*, q. s. to dis.; *glycerin*, ʒi 3-8 (10.0 grms.); *infus. eucalyptus*, ℥ij (60.0 grms.). Sig.: Local appl. v. A-125, 126. Transfusion, salt water, v. A-130. *Steam-vapor of vinegar*, v. A-142.

Ulcerated Throat. Rubber-bag syringe, accord. to age of pat.; *borac. ac. sol.*, i. I-11.

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Dyspnœa.

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THERAPEUSIS.

Ear, External, Diseases.

Atresia of External Meatus.

Traumatic. Make small incis. in post. super. part membrane, dilate with Weber lachry. probe, introd. India rub. tube through open.; as open. increas. use larger tube, or remove ex. layer of mem.; divide remaining portion into 4 or more parts by incis., radiating from centre; denude wall-cov. by flaps and attch. flaps to denud. surf. by sut. or collodion, iv. C-4.

Foreign Bodies. Removal, iv. C-1, 2. Gruber's meth., iv. C-1, 2.

Furuncles. Wash out with alcoh. sol. *boracic acid*, fol. with *bichlor. mer. sol.* 1 to 2000, then appl. *yellow ox. mer.* in *vaselin*. Intern., *liq. potass.* (U. S. P.) gtt. x in water; also *quin. mur.*, gr. ij (0.13 grm.) until gr. viij (0.52 grm.) are taken; reg. diet: no sacch. food. Cleanse with antisep. wash, pack with cotton sat. with 20% sol. *subacet. alum*, cov. with dry cotton and rubber. iv. C-6.

Meatus.

In polypoid exostosis. remove at once, divide ped. with dental elev. or stump-forceps, iv. C-2.

Multiple. Remov. by dental burrs and drills, iv. C-3.

Single: Turnbull's trephine. iv. C-3.

Osteoma. Remove by means of écraseur, iv. C-3.

Otalgia. Protect parts; improve gen. condition, iv. C-44.

Stricture of External Auditory Canal. Incis. on each side of can.; curette; cleanse by inject. *hydrog. perox.*, pack with *salicyl. cotton*, dress daily, iv. C-4.

Vesicles in External Auditory Meatus. Incis.; antisep. washes, iv. C-6.

Ear, Middle, Diseases.

Cholesteatoma. Remove by curette or snare, soften by *liq. ammon.*, wash cav. with 4 % sol. *borac. acid*, dry thoroughly and insufflate *pwd. borac. acid*, iv. C-29. *Trichlor. iod.*, 5 % sol., inject.: use Trautman's glass syringe, iv. C-33.

Deafness. Remove malleus and drum-head of affect. ear, iv. C-9, 10. Miot's method: after operation appl. 20 % *cocaine sol.*, then 1 to 1000 *bichlor. sol.*, close up canal with *borated cotton*, dust with *iodof.* and *borac. acid*, iv. C-14, 15, 17. Removal of drum-head, malleus, and incus, iv. C-11.

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THERAPEUSIS.

EAR, MIDDLE, DISEASES (*continued*)

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ECZEMA.

Ammon. sulph. ichthyolatis, ℥ij (7.78 grms.); *glycerinæ, aq. rosæ*, āā f ℥ss (15.05 grms.). M. Sig.: Local. iv. A-49. Daily baths of 2 or 3 hrs. duration, at temp. 30° to 35° C. (86° to 95° F.); after 4 wks., Scotch baths, iv. A-51. *Aristol* v. A-25. *Gallate of bismuth* or *dermatol*, v. A-37. *Dermatol*, 2 parts; *zinc ox.* and *starch*, āā 24 parts; *vaselin*, 50 parts. M. Sig.: Local. v. A-38. *Ichthyol*, gr. xv (0.97 grm.) a day, v. A-86.

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THERAPEUSIS.

ECZEMA (*continued*).

PUSTULAR.

Salol, gr. xlvj (3 grms.); *chlorhydrate cocaine*, gr. iii 1-10 (0.20 grm); *collodion*, ʒv¾ (20 grms.). M. Sig.: Local appl. v. A-126.

SCROFULOUS, *iod. sod.*, iv. A-51.

RHEUMATIC OR GOUTY, *bicarb.* and *phosphate of sod.*, iv. A-51.

ELEPHANTIASIS.

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EMPHYSEMA.

If heart is weak, rest in bed; *digital.* gr. iij to iv (0.19 to 0.292 grm.) first 24 hrs., i. A-52.

EMPYEMA.

SURGICAL TREATMENT. Evac. pus; wash out cav. with *lysol*, 1 to 5% sol., v. A-93. *Oxygen*, v. A-108. Resect rib, estab. free drain., wash out cav. with lukewarm *boracic-acid sol.*, 30%, i. A-51.

ENURESIS. (See BLADDER, DISEASES.)

Antipyrin, gr. xxiij to xxxviij (1½ to 2½ grms.) in 24 hrs., v. A-22. *Kava-kava*, v. A-93. *Strychnia*, v. A-104. *Rhus toxicodendron*, v. A-122.

NOCTURNAL. Hydro-electric baths, v. C-7.

EPILEPSY.

MEDICAL TREATMENT. *Borax*, avoid gastric and skin troubles by large dose of an antiseptic, *naphthol* and *bismuth salicyl.*, v. A-39. *Ethyl bromate*, in emuls. alkaline sol., or capsules, v. A-40. *Chloralamid*, gr. xv to xlv (1 to 3 grms.), v. A-48. *Hypnotism*, v. A-81. *Ferric brom.*, gr. iij to v (0.19 to 0.32 grm.) v. A-92. *Tinct. œnantha crocata*, v. A-105. *Phosphorus*, gr. 1-20 (0.0032 grm.) t. i. d., v. A-113. *Wine of yoloxochitl*, v. A-142. Dry- and wet- pack, shower-bath, v. D-30. If dependent on aural dis., massage by means of pneumatic spec. and sound, iv. C-23.

IDIOPATHIC. *Antipyrin*, gr. vj (0.39 grm.) combined with *ammon. brom.*, gr. xx (1.3 grms.) t. i. d., v. A-22.

NERVOUS. *Sod. brom.*, ii. A-51. *Ethyl. brom.*, gr. iss–v (.097–.32 grm.) 2 or 3 times daily, in oily emuls.; or *spts. peppermint*. *Antipyrin*, gr. v (.32 grm.) thrice daily, incr. gr. j (.065 grm.) daily until gr. xxv (1.62 grms.) thrice daily are reached. *Antipyrin*, gr. vj (.39 grm.), comb. *ammon. brom.*, gr. xx (1.3 grms.). Sig.: Thrice daily. ii. A-51.

PSYCHOSES. *Potass. brom.*, gr. iii 1-10 to iii 4-5 (20–25 cgrms.) per hecgrm. of weight of pat., intermit. ev. third day, ii. A-49, 50. *Calab. bean*. *Picrotoxin*. *Belladon*. *Borax*, gr. cx (5.4 grms.) daily. ii. A-50.

STATUS EPILEPTICUS. *Hyosc.* (or *Conine*), *hydrobrom.*, *morph. sulph.*, hypoderm., ii. A-46.

SURGICAL TREATMENT. Trephine; excision of affected area, iii. A-19, 20, 25. Trephine; liga. of carotid art.; castration; tracheotomy; excis. of cerv. sympathet. ganglia; incis. of scalp., iii. A-20.

SYMPTOMATIC. *Sod. borate*, ii. A-51.

SYPHILITIC. Trephine, iii. A-25.

TRAUMATIC. Trephine and remove damaged bone, iii. A-21, 24.

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coloboma of choroid, bilateral
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THERAPEUSIS.

ERYSIPELAS.

Coat over surface *ammon. sulph. ichthyolatis, etheris,* āā f ʒij (6.75 grms.); *collod.,* f ʒss (15.0 grms.); M., iv. A-49. *Nitrate of aconite,* gr. 1-600 (1-10 milligramme) every 2 hrs., v. A-3. *Aristol,* local, v. A-28. *Carbolate of camphor,* local, v. A-44. *Ichthyol,* intern., gr. xv (0.97 grm.) a day; local, *ichthyol* comb. with *lanolin, zinc.* oint., or *glycerin.* 5 to 50%. v. A-86. *Manganese,* v. A-94.

FOR HYPERÆMIA, *ergotole,* local, v. A-65.

ERYTHEMA.

Ichthyol, gr. xv (0.97 grm.) a day. Local, *ichthyol* comb. with *lanolin, zinc* oint., or *glycerin.* v. A-87.

ETHER ANÆSTHESIA.

NARCOSIS. In obese, alcoholic, or diabetic cases, in shock or loss of blood and in operations about head, give *ether;* before etherization give hypod. inject. *morphia* gr. 1-16 (0.004 grm.) and *atropia* gr. 1-128 (0.0005 grm.), iii. P-14.

ETHMOID SINUS, DISEASES.

Expose ethmoid cells by means of snare; use elect. burr or curette, iv. D-24.

ETHYL BROMIDE.

NARCOSIS. Mode of admin. and when used, iii. P-15. Rules for admin., iii. P-16.

ETHYL CHLORIDE, ANÆSTHESIA BY.

Use locally; method of admin., iii. P-19.

EYE, DISEASES.

CHOROID, DISEASES.

CHOROIDITIS, SYPHILITIC. *Mer. inunct.* ʒss (1.94 grms.) daily for 2 yrs., iv. B-134.

LEUCOSARCOMA. Early enucleation, iv. B-90.

MELANOSARCOMA. Complete evisceration, iv. B-90.

CILIARY BODY, DISEASES OF.

NEURALGIA. Galvano-caut., iv. B-72.

CONJUNCTIVA, DISEASES.

CONJUNCTIVITIS, CATARRHAL. Scarifications and lavage, with 2 or 3 % sol. *silv. nit.*; later, paint lids with *tinct. iodine,* iv. B-53.

GRANULAR AND TRACHOMA. Massage of conj. with *pwd. boric acid. Creolin,* 1 % sol. *Corros. sub. sol.* 1 to 100. *Silv. iod.* Curette, and wash with 4 % sol. *pwd. boracic acid.* iv. B-60. Darier's meth. Harvey's scarification meth. Touch lids twice a wk. with mitig. stick *silv. nit.,* wash off excess immed.; on interv. days use *oint. yellow merc.* and *atropia.* iv. B-61. Smith's meth., iv. B-61, 62. Electrolysis. Rub in. m. with cotton sat. with *bichlor. mer.* 1 to 1000. iv. B-62. Excis. palpeb. *cul-de-sac. Iron, alum. zinc,* and *copper,* āā appl. daily to tarsal conjunct. Lemon-juice, appl. local. iv. B-63. *Iodof. oint.* gr. j to v to ℥j of *vaselin* (0.065 to 0.32 grm. to 31 grms.), iv. B-141. *Silv. nit.* (1 to 2000), instil. twice daily, iv. B-53. *Iron tonics,* iv. B-58. *Corros. sub.* 1-5000 to 1-2000, appl. local., iv. B-58.

PHLYCTENULAR. *Benzo-phenoneide,* locally, v. A-37.

OPHTHALMIA NEONATORUM.

PROPHYLAXIS. *Sublimate lotion,* gr. 1-9 (0.007 grm.) to 1 qt. (1 litre) and cauterize during first 24 hrs. with 1 % sol. *argent. nit.* Vincent's meth. Crédé's meth. Cleanse with plain water. iv. B-56. *Silv. iod.,* iv. B-60. Sarg's *glycer. soap,* iv. B-140.

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THERAPEUSIS.

EYE, DISEASES (*continued*).

OPHTHALMIA, PURULENT. If ulceration of cornea occurs, evert lids and apply *perchlor. mer.* (4 % sol.) once a day, assoc. with ¼ % sol., as a wash, iv. B-58. *Pyoktanin pencils* (1 %), iv. B-144.

SYMPATHETIC. De Wecker's meth. of treat.; Abadie's meth., iv. B-109, 110; Pritchett's meth., iv. B-111. Intra-oc. inject. *corros. sub.* 1-1200 gr. (1-20 milligrm.), iv. B-140.

PTERYGIUM. Make incision around cornea; divide memb. by cut. through midd. to base, sev. attachment to lids; flaps are then cut out of conjunct. and underlying tiss. abov. and bel., sutur. together, iv. B-51, 52. Price and Hobby's comb. meth., iv. B-52.

TUBERCULOSIS. *Tuberculin*, iv. B-52; iv. B-143.

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CARCINOMA. Remove by strangulation at base, by means of thread, iv. B-54.

GUMMA. Specific treat., iv. B-51.

CORNEA AND SCLEROTIC, DISEASES OF.

EPISCLERITIS. If rheumatic or syphilitic, electric baths, pos. pole over sup. cerv. ganglion, neg. pole introd. into glass contain. 1 to 2 % sol. *salicyl. lithium*, iv. B-72.

KERATITIS. *Benzo-phenoneide*, local, v. A-37.

HYPOPYON. Hot fomentations, antisep. compress. and bandage, *atropine*, rest, *anodynes*, and *quinine*. Paracentesis. Valude's meth. iv. B-70. If from traumatic ulcer, instill. weak sol. *quin. sulph.* and *atrop.* every 2 or 3 hrs. Instill. sol. *sulph. eserine* gr. ij (0.13 grm.) to ℥j (31 grms.), and constant appl. of bandage. Intern., *tonics*. iv. B-70.

SUPPURATIVE. *Aristol*, iv. B-145.

SYPHILITIC. *Mercur. inunct.*, ʒiss (1.94 grms.) daily for 2 yrs., iv. B-134.
OPACITIES. Ferdinand's meth., Malgat's systematic massage meth., iv. B-71. Intern., *cannabis sativa*, 10 drops 1 % sol., 4 times daily, alternat. night and morn. with *sulphur*, gr. 1-100 (0.00065 grm.). *Corros. sub.* gr. 1-1200 (1-20 milligrm.), subconjunct. inject. iv. B-140. *Trichlor. iodine*, iv. B-141.

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INFECTIOUS. . Touch twice daily with *tinct. iod.*, iv. B-70. *Aristol*, iv. B-145.

PHLYCTENULAR. Warm sol. *pot. chlor.*, gr. v (0.32 grm.) to ℥j (31 grms.), iv. B-70. *Iodol. oint.*, gr. j to v to ℥j *vaselin* (0.065 to 0.32 grm. to 31 grms.), iv. B-141.

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OF INFER. RECTUS. Tenot. of correc. sup. rectus, iv. B-36. If faulty attach. capsular advancement, iv. B-41.

STRABISMUS. Baker's rules for oper., iv. B-39. If in children, cov. good eye for stated numb. hrs. daily; never oper. under 3½ or 4 yrs. of age (Mackinlay), 6 yrs. (McHardy). Orthoptic exer. iv. B-40.

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IRIDO-DIALYSIS. Smith's oper., iv. B-75, 76.

IRITIS, RHEUMATIC. *Tinct. aconite*, ♏ x (0.60 c.cm.), combined with *iod. pot.* and alkalies, v. A-3.

SEROUS. Paracentesis of ant. chamber, iv. B-75.

SUPPURATIVE. *Methyl-violet* combined with *atropia*, v. A-18. If rheumatic, with albuminuria, *ichthyolate of ammonium*, gr. iij to viiss (0.19 to 0.48 grm.) daily, v. A-88.

SYPHILITIC. Iridectomy; conjunctival inject. *corros. sub.*, iv. B-75. *Mer. inunct.*, ʒss (1.94 grms.) daily for 2 years, iv. B-134.

SARCOMA. Remove by iridectomy, iv. B-73.

TUBERCULOSIS. Remove affected part or enucleation; if other organs are affect., expectant treat., iv. B-74.

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CHRONIC CATARRHAL. Extirpate the sac, iv. B-35.

EPIPHORA. Excis. of palpebral port. of gland, iv. B-30, 31. Remov gland by thermo-caut., iv. B-31.

OBSTRUCTION. Incis. and pass Bowman's sound ev. day for 8 days, fol. with trip. furrow. sound., permitt. instilla. of 1 % sol. *zinc chlor.* or *silv. nit.* After cure is effect., freshen edge of wound, bring together by catgut sutures, iv. B-32.

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CONGENITAL. If double, keratotomy, iv. B-87. Graefe's dressing, iv. B-88.

INFANTILE. Iridectomy, iv. B-80, 81. Introd. *boric acid* betw. lids at night. Follow with *calomel* purge. *Naphthol* and *salicyl. bismuth* as intest. antisep. iv. B-82. Roosa's method. Foerster's oper. If capsulotomy is necessary, use Galezowski's knife. In iridectomy, Loring's meth. with Graefe's knife. In prolapse of iris, immed. iridectomy. iv. B-83.

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ENTROPION. Green's oper. Thermocautery incis. Minney's oper. iv. B-48, 59. Wolff's transplantation meth.; Thiersch's meth., iv. B-49.

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GRANULAR. *Jequirity*, aq. sol. instill. into eye twice daily, fol. with *zinc sulph.* gr. v (0.30 grm.) to ℥j (30 grms.), v. A-92.

PTOSIS. Gillet de Grandmont's oper., iv. B-47, 48.

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CHOLELITHIASIS.

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COLIC. *Olive-oil*, ℥vi⅔ (200 grms.): *ox-gall*, ʒv¼ (20 grms.), may be added to *olive-oil*, i. C-39. For urticaria following infectious jaundice, intestinal antisep., i. C-39.

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HÆMOGLOBINURIA.

Quinine given early and in decided doses. If temp. be above 103° F. (39.5° C.), give gr. xx (1.3 grms.) contin. in doses of gr. (0.65 grm.) ev. 3 hrs. for 24 hrs.; then lessen dose gr. v ev. 3 hrs., comb. with (first) two doses gr. ij (0.13 grm.) of *calomel*, in ten hrs.; after last dose of *calomel* give *Seidlitz powd.*, i. L-120. *Calomel*; *sod. hyposulphite*, ʒj (4 grms.) ev. 3 hrs. until free purgation, i. L-121.

CARDIAC WEAKNESS. *Digital.*, i. L-120. FOR VOMITING, *bismuth* and *opium*, i. L-120. *Morph.* and *atrop.* hypoderm.; appl. blister over epigastrium, i. L-121. Abundance of cold water as a diuretic, i. L-121. Cupping over loins, milk or buttermilk diet, rest in bed; *calomel* in begin. of case to regulate bowels; then *quin. bisulph.* hypoderm., i. L-121. *Strychnine* gr. 1-50 (0.0013 grm.) hypoderm. ev. 3 hrs. until full physiol. effect is obtained, i. L-121.

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HÆMOPHILIA.

Milk, *alcohol*, *tinct. iod.*; avoid foods rich in *potass.*, ii. E-18.

HÆMORRHAGE.

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HAY FEVER.

Anæsthet. with *cocaine-phenol* and appl. 10% sol. *sulph. atropia*; small doses *aconitine* ev. hr.: *menthol*; *menthol* and *ammon. carb.* comb., used as smelling-salts; *cocaine*, iv. D-27. *Camphor-thymol* (5% sol.) in *lanolin*, appl. local., iv. D-28. *Menthol* comb. with *ammo.*; *menthol* gr. xxx (1 grm.) to ℥j (37 grms.) *liq. vaselin*, use as spray, or *menthol* gr. x to xv (0.65 to 0.97 grm.) with *sugar of milk*, as a snuff, v. A-94.

HEADACHE. (See CEPHALALGIA.)

ANÆMIC. *Cannab. Ind.* and *iron*, ii. C-63.

CONGESTIVE. *Catharsis*; *bromides* and *cocaine*, ii. C-63.

LITHÆMIC. Restrict diet, *salicyl. ac.*, *alkalies* or *colchic.*, ii. C-63.

NERVOUS. Hypnotism, ii. D-28.

HEART, DISEASES.

DILATATION. *Venesection* to relieve right vent., or apply leeches over liver, follow by hot *poultices*; at same time, *purgatives*, i. B-16. *Calomel* or *blue pill* or *gray pwd.* gr. j to v (0.065 to 0.32 grm.), with *colocynth* and *hyoscyamus* or *rhubarb*, fol. by mild saline, i. B-17.

DIET. Small amt. of solid or semi-solid food ev. 3 hrs., i. B-18.

FOR THIRST BETWEEN MEALS, *cream-of-tartar* drinks, i. B-18. Exercise regular and daily; Oertel's treat., i. B-18. *Tinct. cactus*, ♏ xx (1.25 grms.) ev. 4 hrs., v. A-42.

IF ASCITIC OR PLEURAL EFFUS., aspirate, drain by Southey's tubes, i. B-17.

TO STRENGTHEN HEART, *digital.*, *strophan.*, *sparteine*, *squills*, *caffeine*, *convallaria*, or *apocynum*, comb. with *strych.*, i. B-17.

DILATATION, MOMENTARY. *Sparteine*, *digitaline*, or *iod. pot.*, i. B-22.

FATTY DEGENERATION. Out-door exercise, reg. feeding, simple diet, keep bowels open, i. B-21.

HYPERTROPHY. Lessen work of heart by dim. artero-capill. resist., by *nitroglycer.* and the *nitrites*. Strengthen heart by *strych.* and *digital.* i. B-14.

MYOCARDITIS. *Tinct. cactus*, 80 to 100 drops daily, v. A-42. *Diuretin*, v. A-61.

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IF SYNCOPE, stimulants, i. B-23.

PULSE, PERMANENTLY SLOW.

IF DUE TO BULBOUS ISCHÆMIA, 8 to 12 drops of 1% sol. *nitro-glycerin* per day, i. B-34.

RAPID HEART. Galvan. curr. to great nerves of neck, v. C-8.

RENAL COMPLICATIONS. Milk diet, i. B-31.

SYNCOPE. *Amyl nitrite*; *alcohol*, *tea*, *coffee*, and *caffeine*, i. B-34.

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HEART, DISEASES (*continued*).

SENILE HEART. If deficient hæmoglobin, *iron*, i. B-40.

FOR PAIN, *nitrite of amyl* and *nitroglycerin*, i. B-40.

FOR HIGH INTRA-ARTERIAL BLOOD-PRESSURE, *pot. iod.* gr. ij to iij (0.13 to 0.19 grm.) ev. 8 to 12 hrs.; if gouty, comb. with *potash bicarb.* or *colchicum*; *calomel*, *Vichy water*, i. B-40.

IF DYSPEPSIA, *pepsin*, i. B-40. Exercise, i. B-37. Diet, i. B-38. *Tinct. digital.* ♏ x (0.65 grm.) ev. 24 hrs., or *digitalin* (Nativelle's granules), 1 ev. 24 hrs.; *strophanthus*, *strychnine*, i. B-39. *Arsenic*; *arsenious acid* gr. 1-100 (0.00065 grm.), comb. with *strych.* or *digital.*, i. B-40.

TACHYCARDIA. Glass of cold water, or cup hot coffee; emetics, i. B-26.

AT MENOPAUSE, mild *purgatives*, mountain-air, active exercise, cold, wet applic. to lower abdomen; small doses of *bromide*, i. B-32. Huchard's meth., i. B-33.

VALVULAR DISEASE. *Tinct. cactus*, 80 to 100 drops daily, v. A-42. *Convallaria majalis*, gr. 1¼ to 1½ (0.08 to 0.10 grm.) in first 24 hrs., v. A-57. *Diuretin*, v. A-61, 63.

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HERPES.

Alcohol (90% sol.) applied by means of compress, or 2 parts *resorcin* to 100 parts *alcohol*, v. A-6. *Antimony*, v. A-19. *Aristol*, v. A-27. *Exalgin*, v. A-70. *Ichthyol*, intern., gr. xv (0.97 grm.); local., comb. with *lanolin*, *zinc oint.*, or *glycerin* (5 to 50%), v. A-87. *Thiol*, v. A-137.

HERPES ZOSTER.

FOR PAIN, blisters over nerve or contin elect. curr.; *antipyrin*, iv. A-21. Inunct. *oil* or *vaselin*, foll. by *pwd. starch* comb. with *bismuth*, *subnit.*, *zinc ox.*, *boric acid*, or *opium*; *cocaine*; remove crusts with warm baths. *Carron-oil*, with *laudanum* or *glycerole of starch*, iv. A-23.

IF GANGRENE, antiseptics, *carbol. acid*, *Champonnière pwd.*, with *pwd. benzoin*, *iodoform*, *carbonate magnesium pwd.*, *gray cinchona*, or *tinct. eucalyptus.*; intern., stimulants, tonics, iv. A-24.

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FOR NERVOUS LESIONS, *quinine*, *antipyrin*, *pot. brom.* and *morph.*; best is *hydro-therap.*, iv. A-27.

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Pulv. calcis vivæ (air-slaked), ʒj (3.89 grms.): *arsenici trisulphuret* (orpiment), gr. ij (0.13 grm.). M. Sig.: Add water enough to form a paste and mix. Appl. local. iv. A-51, 52.

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Influenza (*continued*).

or *salol*, gr. iiss (0.16 grm.) each ev. 3 hrs. for a day, i. H-16. Gentle fumigations, diaphor., and revuls.. and strong tonics, i. H-16. *Strychnine, caffeine, alcoh., ammon.* as stimulants, i. H-16. *Tinct. nux vom.* gtt. v–x ev. 3 to 4 hrs., i. H-16. *Antipyrin*, v. A-21. *Exalgin*, Gorodichze's formula, v. A-70.

For muscle-pain, *salicylbromanilid*, v. A-125.

For neuralgia, sweat-baths of steam or hot air, i. H-15.

Insanity.

Hallucinations. *Chloralamid*, v. A-48. *Hypnotics; atropine*, gr. 1-64 to 1-32 (0.001 to 0.002 grm.) hypoderm.; *hyoscine; duboisine*, gr. 1-130 to 1-64 (½ to 1 milligrm.), v. A-35.

Hypochondria. *Uralium*, v. A-140.

Hysterical. *Hypnotism*, v. A-81.

Mania, Acute. *Chloralamid*, gr. xv–xlv (0.97–2.93 grms.), ii. D-31. *Hyoscine*, gr. 1-300 to 1-100 (0.00022 to 0.00065 grm.), v. A-79. *Sulphonal*, v. A-134.

For collapse, subcutan. inf. of Oj (500 c.cm.) of 3% *salt sol.* morn. and aft., ii. D-30.

For irritability, *hyoscine*, gr. 1-100 (0.00065 grm.) twice daily; *sulph. of duboisine* hypoderm., gr. 1-33 (2 milligrms.), ii. D-31. *Cannabis Ind.; hyoscine; chloral; somnal*, ʒss to j (1.94 to 3.89 grms.), ii. D-32.

To quiet delirium, warm bath, foll. by cold effus. *sulphonal*, ii. D-30, 32.

Mania, Chronic. *Sulphonal*, v. A-135. *Uralium*, v. A-140.

Melancholia. Overfeed., mass., outdoor exercise, ii. D-12.

Paralysis, General. (See Brain, Diseases.) *Sulphonal*, v. A-135. *Hyoscine*, gr. 1-100 to 1-300 (0.00022 to 0.00065 grm.), v. A-79. *Hypnotism*, v. A-82.

For tremors, *hyoscine*, gr. 1-100 (0.00065 grm.) t. d., ii. D-31.

Insomnia.

Hypnotism, ii. D-28. *Pure gluten*, v. A-11. *Nitrous-ox. gas*, v. A-102. *Somnal*, v. A-131. *Sulphonal*, v. A-135. *Galvanism*, v. C-9. Hypnotics, *opium, ox-gall*, and *cascara sagrada*, as *adjuvants; morph.*, hypoderm. inject., ii. D-12. *Opium*, ii. D-32. *Chloralamid*, v. A-48. *Hypnotism*, v. A-83. *Nitrous-ox. gas*, v. A-102. *Sulphonal* comb. with gr. ⅛ to ¼ (0.0081 to 0.016 grm.) aq. ext. *opium*, v. A-136.

Gastro-intestinal. Careful diet; *pepsin, alkalies*, or *acids*, p. r. n.; laxatives or mercur. alternat., ii. D-29.

Nervous, with Neurasthenia and Hysteria. *Sulphonal*, gr. xvss to xxxj (1 to 2 grms.) at a dose, ii. D-30.

If excitement or delirium, *amylene hyd.*, ʒj to ij (4 to 8 grms.), ii. D-30.

If due to pain, *sulphonal* and *amylene hyd.*; *urethan*, gr. xvss to xxxj (1 to 2 grms.) at a dose; *hypnone*, gr. iss to vii¾ (0.1 to 0.5 grm.), ii. D-30.

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Insomnia—Beard, Ranney, *Boston Medical and Surgical Journal*, ii. D-29; Surzycki, ii. D-30.

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INTESTINES, DISEASES.

FOREIGN BODIES.

OBSTRUCTION. *Morph.* hypoderm., 3 to 4 times daily, p. r. n., i. D-18. Noble's enemata if due to paralysis or following plastic op., v. A-64.

INTESTINES, SURGERY.

CALCULUS, laparotomy, i. D-20.

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OBSTRUCTION. Inject. of *coal-oil*, thro. long rect. tube, foll. by inject. of Oj ($\frac{1}{2}$ litre) of warm water, i. D-19. TO SOLVE FÆCAL ACCUMULATION, *olive-oil*, Oj to ij ($\frac{1}{2}$ to 1 litre) in divid doses. Laparotomy, i. D-19. Wash out stomach, i. D-18. Laparotomy, with division of any fibrous bands, iii. C-60. Ileostomy foll. by enterorraphy, iii. C-61. Warm fomentations. Recumb. position, elevate pelvis; no food by mouth; rectal alimentation Extern. use of *belladonna* and *glycerin*. Intern., *belladonna* and *opium*, to check peristalsis and pain. Morris's meth of oper. iii. C-62. Ileostomy, iii. C-67. Lumbar colotomy, iii. C-73. Paul's meth. enterorraphy, end-to-end method, iii. C-75.

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DERMOID CYST. Laparotomy, iii. C-65.

JAW, SURGICAL DISEASES.

FRACTURE. If compound, interdental splint and cranial support, iii. K-1, 2. Irrig. wound and mouth with 2 % sol. *carbol. acid* ev. 2 or 3 hrs.; remove all spic. of bone, iii. K-2. Bridge splint., iii. K-3, 4.

NECROSIS, PHOSPHORUS. Removal by subperiosteal and intra-buccal op., iii. K-17.

TUMORS. In aneurismal tumor of alveolar process, inject. perchlor. iron, 1 to 4 (5 minims to 0.32 grm. at each inject.), iii. K 56.

CYSTS. Excision, scrape cav., iii. K-10. If at root of teeth, remove teeth and arrest hæm. with *antipyrin*, tampon, or thermo-cautery, iii. K-13.

EPITHELIOMA. Excision: skin transplant.; Thiersch's meth., iii. K-10. Excision of alveolar process; arrest. hæm. by actual caut. iii. K-17.

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Arthritis, Rheumatoid. Electric bath, pos. pole at head of bath, v. C-19.

Foreign Body. Incision, electro-magnet, v. C-22.

Tuberculosis. *Formic acid; aërotherapy* and salt-water baths, iii. L-3. **Of Elbow.** Resection, iii. H-12. Lannelongue's meth., iii. H-26, 27. Max Schüller's meth., iii. H-27. *Iodof.* 2.0; *glycerin*, 20.0; *sod. formate*, 0.5 to 1.5; inject sol. into tubercular area, iii. H-27. McCurdy's elastic extension apparatus, iii. H-30. **Of Knee.** Resection, iii. H-9, 10.

Kidney, Diseases.

Cysts. Lumb. nephrectomy, excis. walls, close renal wound by sut., iii. E-18.

Hydronephrosis. Lumb. nephrectomy, iii. E-17.

Nephritis, Interstitial. Hypoderm. inject. large quant. of 0.6 to 0.7 % sol. *sod. chlor.* once or twice daily, v. D-34. *Diuretin*, v. A-61; v. A-63.

Nephritis, Parenchymatous. Milk diet, v. A-10. *Glycerin-jelly* by rect., v. A-10. *Diuretin*, v. A-63.

Pyelitis, Pyelo-Nephritis.

Chronic. As astringents on renal pelvis, *gallic acid* or *lead acetate;* used only in later stages, i. L-75. Counter-irritants, as *act. cautery* and *iodine*, i. L-75.

First Stage. Blood-letting or intestinal revulsion, i. L-74. Leeches, wet-cups, i. L-74. *Calomel, scammony;* absolute milk diet (skimmed milk), i. L-74. Tonic doses of *quinine* and *alcohol*, i. L-74.

For Pain. *Opium* and *belladonna*, i. L-75.

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Pyelitis, Pyelo-Nephritis.

Calculous. Milk diet; *benzoate of soda*, with *tannin* or *ergotin*, i. L-75.

Chronic Forms. Hygienic treat., keep up functional activity of skin; rest in bed; mod. exercise; keep up body heat: milk diet, i. L-74. Render urine aseptic by small doses of *benzoate of soda* and *balsams; eucalyptol; salol; borate of soda; boracic acid; Haarlem oil*, i. L-74

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THERAPEUSIS.

LABOR.

AFTER-PAINS. *Cupric arsenit.*, gr. 1-1000 (0.00065 grm.), in teaspoonful of water, ii. J-33. *Ginseng*, v. A-75.

ANÆSTHETICS. *Cocaine* (5 % sol.) to cervix and vag., or ♏xv to xx (0.90-1.25 grms.) of 5 % sol. hypoderm. into each labium before delivery. ii. J-7. Hypnotism. ii. J-5. *Antipyrin*; [illegible]. In severe pains, with rigid cervix, great resistance of perineum, *chloroform*. ii. J-7.

ANTISEPTICS. Vag. inject. of *cor.-sub. sol.* (1 to 1000) twice daily; begin 4 weeks before labor and last week give, ev. 2 days, tampon of *iodof. gauze* in vag. between inject.; after labor, irrig. with *cor.-sub. sol.* and insert tampon, changing p. r. n. *Iodof.* compress over vulva. ii. J-2. *Lysol*, 1 % sol., ii. J-4. Irrig. uterus and vagina with 5 % *sol. sulphate copper*, v. A-57.

IF LACERATIONS, suture or apply strong *carbol. acid.* Flush uterus with hot water. ii. K-1.

COMPLICATIONS.

CORD, PROLAPSUS. Emery's meth., ii. J-21.

HÆMORRHAGE. Dilatation, version, and delivery. *Ergot* subcutan. Stimulants. If head descends, perforation; if not, craniotomy and delivery. ii. J-24. If os is undilated, plug vagina, ii. J-24. If due to vascular anomaly of membranes, rupture and bring down a foot. Intra-uterine tampons of *iodof. gauze*, ii. J-24. If due to altered state of blood, weak sol. of *chlor. of iron*. If due to laceration of cervix, suture at once. ii. J-24. If due to myomata, pack cavity with *iodof. gauze*, ii. J-25. *Sod. benzoas*, gr. xlvj (3 grms.); *caffeine*, gr. xxxj to xxxviii¾ (2 to 2.5 grms.); *aq. destil.*, ♏xcvj (6 grms.). Sig.: Inject. 6 to 10 syringefuls daily. ii. J-25.

HYMEN, UNRUPTURED. Ahlfeld's meth., ii. J-27.

PARALYSIS, TRAUMATIC. *Tinct. nux vom.*, ♏x (0.65 grm.) twice daily; massage and electricity, ii. K-8.

PELVIC OBSTRUCTION. Porro's oper. If threatened rupt. of uterus, Porro's oper., or Cæsarian sect. ii. J-39, 40.

UTERINE INERTIA. *Wine of ipecac.* ♏x to xv (0.66 to 1 grm.) doses ev. 10 mins. for 2 to 3 doses, ii. J-12. *Acetanilid*, gr. iij to iv (0.19 to 0.36 grm.). *Hydrastis Canadensis*, ♏c to cc (6.25 to 12.50 grms.) daily. ii. J-13. To cause uterine contractions, cold sitz-bath, v. D-31. Cold douche, rub dry, and wrap in blanket, v. D-32.

UTERUS, RUPTURE. Immediate laparotomy, ii. J-27. If rupture through posterior wall, disinfect borders of rent and entire uterine cav. with *thymol* or *boracic sol.*, and keep edges of rent. in contact by press. to check hæmorrhage. ii. J-28, 31. Appl. strip of *iodof. gauze* over rent. Tampon cervix and vag.; drain. If hæmorrhage has been severe, use fenestrat. drain-tube. Ice-bag to hypogast. after remov. compress. *Opium* dur. first 3 days. If discharge becomes fetid, irrig. through drain-tube. ii. J-28. If intestines project through the tear and become strangulated and slough, laparatomy and lateral anastomosis. Underhill's meth. ii. J-29.

AUTHORS QUOTED.

LABIA, NERVE-ENDINGS—J. C. Webster, Carrard, Ballantyne, Krause, Schweigger-Seidel, Kölliker, Klein, Frey, v. G-18.

LABOR—ANÆSTHETICS: Lefour, H. Fraipont, Delbœuf, ii. J-5; G. C. Kingsbury, ii. J-6, J. Luys, Chaigneau, Jeannel, Doléris, Auvard, Secheyron, ii. J-7; Lord, ii. J-8. **AFTER-PAINS**: Boardman Reed, T. J. Bennett, ii. J-33. **ANTISEPTICS**: Hégar, ii. J-1; Verchère, Axmann, C. M. Green, ii. J-2; Leopold and Pantzer, Hiram Corson, Traill Green, J. C. Reeves, ii. J-3; J. Lucas-Championnière, Giuseppa Roncaglia, T. A. Dickey, J. W. Bovee, Tarnier, W. H. Ribbie, Budin, E. Pynchon, H. Stapfer, N. Charles, I. S. Hileman, L. S. Burchard, A. Dixon, *Report of Boston Lying-in Hospital*, Pée, ii. J-4. **BREECH**: R. A. Murray, ii. J-17; Winter, Staedler, Kormann, Fischer, Crédé, Bischoff, Mensinga, ii. J-18; Edwards Reynolds, Deventer, ii. J-19. **BROW PRESENTATION**: Hubert, ii. H-14. **CÆSARIAN SECTION**: Harris, Zweifel, Leopold, Harris, ii. J-36; Sänger, Harris, Crimail, C. P. Noble, Howard A. Kelly, ii. J-37; Korn, Hugh McColl, Manton, Carsten, Longyear, Martin, Cogshall, Howard A. Kelly, ii. J-38; Münchmeyer, Queirel, G. Galand, R. F. Granger, Murdoch Cameron, J. N. Bartholomew, M. Bar, Guéniot, Seth Hill, P. Meirowitz, Herman, Howard A. Kelly, H. P. Wenzel, Henry Gibbons Jr., E. Fraenkel, J. Praeger, Staude, ii. J-39. **PORRO'S OPERATION**: Clement Godson, ii. J-39; Piskaçek, Giusani, Joseph Price, G. G. Maclaren, Wm. E. Ashton, Frank G. Helbing, J. F. Baldwin, Colin G. Campbell, Bagot, N. T. Brewis, James Murphy, Carmichael, ii. J-40. **CERVIX AND OS, RIGIDITY**: Auvard, Guéniot, ii. J-25; Loviot, Guéniot, Porak, I. L. Van Zandt, A. Zimmermann, Maygrier, Lugeol, Ouimet, Blanc, Mesnard, ii. J-26 **CRANIOTOMY**: *Northwestern Lancet*, ii. J-33; G. B. Foppiano, E. H. Grandin, Lusk, Garrigues, Grandin, Murdoch Cameron, ii. J-34; Barnes, Murdoch Cameron, Lusk, Garrigues, ii. J-35. **DYSTOCIA**: Westerschulte, ii. J-22; E. Blanc, Loison and Duchesneau, Conklin, J. T. Hartill, G. Braun, J. W. Bovee, ii. J-23. **FACE PRESENTATION**: E. P. Bernardy, ii. J-14. **HÆMORRHAGE**: H. C. Coe, ii. J-23; Murray, Fry, Lawson Tait, Coe, J. W. Ballantyne, Velits, ii. J-24; Victor Stäheli, Misrachi, A. B. Loving, Julius Moses, Czempin, Jessie G. Forrester, Schauta, A. P. Clarke, E. T. Davies, Everke, Donagan, H. E. Noble, Long, Edis, C. P. King, W. Brinton, Eugene Anderson, S. M. Smith, A. A. Macdonald, G. W. Wagoner, C. V. High, ii. J-25. **HISTORICAL DATA**: J. K. Kimura, ii. J-42; Hanaoka, ii. J-46. **HYMEN, UNRUPTURED**: Ahlfeld, Hirst, ii. J-27. **INSTRUMENTS**: Duke, ii. J-40; R. Milne Murray, Tarnier, J. E. Elston, A. B. Lyman, T. J. McGillicuddy, W. O. Lambert, C. R. Hoffmann, Peter McCahey, A. W. Herzog, R. L. Dickinson, ii. J-41; Dargatz, D. L. Hubbard, Henry Leaman, Poirier, ii. J-42. **NOMENCLATURE**: D. Berry Hart, ii. J-13. **OCCIPITO-POSTERIOR**: Zinke, A. Worcester, ii. J-15. **HEAD**: Bar, ii. J-15; Pajot, Guéniot, Loviot, Henry, ii. J-16. **PERINEUM**: L. Conder, Auvard, Holland J Cotton, Alexander Duke, J. Neville, M. Jackson, ii. J-32; E. Bonnaire, Croft, Cheney, ii. J-33 **PLACENTA PRÆVIA**: Wm. T. Lusk, ii. J-8; Barnes, Murphy, Lusk, Wyder, Braxton-Hicks, Schroeder, Gusserow, ii. J-9; Schroeder, Braxton-Hicks, Wyder, Schroeder, Gusserow, ii. J-10; Lomer, S. F. Zimin, J. B. McGaughey, ii. J-11; M. Herzog, Floel, Schwartz, Condere, Naylor, Wigmore, Stewart, Guthrie, Lockhart, Myers, T. H. Huzza, Kendall, Emile Blanc, Vinke, Lewis, Bolin, Gray, Cummings, Hill, Newman, Purslow, Rhyne, Newman,

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SHOULDER. If present. of both shoulders following release of head, deliver arms first, ii. J-16.

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ACUTE. If loss of voice, large doses of *strychnine*, iv. F-3. *Chlorphenol* inhal., v. A-53. Inhal. *menthol*, v. A-94.

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FOR LOSS OF VOICE IN SINGERS. Labus's meth. of flaying vocal bands, iv. F-4. Inhal. *menthol*, v. A-94.

SYPHILITIC. *Hydrarg. thymolo. acet.*, gr. xxiii¼ (1.50 grms.); *mucil. gum arab.*, gr. vii¾ (0.50 grm.); *aq. dest.*, ʒv¼ (20.00 grms.). M. Sig.: Inject 1 1-6 grs. (0.075 grm.). iii. F-33. *Merc. perchlor.* comb. with *pot. iod.*; local app. *biniod. merc. sol.*, iv. F-8.

TUBERCULOSIS. *Acid salts of cantharidin. Pot. iod.*, ʒiiss (10 grms.); or *tinct. iod.*, ʒi¼ (5 grms.); *tannin*, ℥j (30 grms.); *glycerin*, ℥viii¼ (200 grms.); *alcohol*, ℥i⅝ (50 grms.). M. Sig.: Tablespoon. in wine. Curette. Caut. with *lactic acid.* iv. F-5, 6. Five per cent. sol. *hydrogen perox.* inhal., v. A-78. *Trichloracetic acid*, v. A-139.

ŒDEMA. *Pilocarpine*, gr. 2-5 (25 milligrms.) inject ev. 25 min., iv. F-15.

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AUTHORS QUOTED.

LABOR, PLACENTA PRÆVIA (*continued*). Vondergoltz, Ahlfeld, Piggot, Allen, Hardon, Wysham, ii. J-12. PRECIPITATE LABOR: Laugier, iv. J-8. SHOULDER: G. Braun, Auvard, Olivier, ii. J-16; J. W. McLane, ii. J-17. STATISTICS: Pozzi, Tournay, E. R. B. Elderdice, N. Charles, W. H. Taylor, W. A. Dunn, G. S. Stein, G. H. Rohé, W. Sealy, A. Worcester, W. J. Cree, J. L. Beeston, ii. J-12. TRANSVERSE PRESENTATION: Farabeuf and Varnia, ii. J-17. TWIN LABOR: Brém, Kézmarsky, Lusk, Spiegelberg, ii. J-20; Brém, Spiegelberg, Kleinwächter, Howard A. Kelly, ii. J-21. UMBILICAL CORD—HÆMATOMA: A. Bussman, ii. J-22. KNOTS: Lyncker, Lefour, Paul Bernard, H. W. Smith, A. P. Haynes, S. W. Lacey, J. I. Brockbank, Thibaudet, ii. J-22. PROLAPSUS: Z. T. Emery, ii. J-21. RUPTURE: Loviot, T. E. Dryer, J. Simpson, ii. J-22. UTERUS—INERTIA: Drapes, ii. J-12; H. Stokes, F. E. Verney, Bossi, ii. J-13. RUPTURE OF: Leopold, ii. J-27; J. Slechta. Pawlik, ii. J-28; H. Wardner, Colaneri, Vinay, J. B. Lewis, Henry Love, Underhill, Lawson Tait, ii. J-29; H. C. Coe, G. Braun, Guéniot, Carl, T. W. Jenkins, ii. J-30, T. V. Crandall, Paschen, Lomer, G. Walcher, Hofheinz, Mermann, ii. J-31. INVERSION OF UTERUS: J. M. Baldy, Aveling, ii. J-31; S. Rémy, Carbonell, B. B. Levengood, ii. J-32. VAGINA, CONGENITAL NARROWING OF: Kleinwächter, ii. J-26.

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TUMORS.

HYDATID CYSTS. Puncture, i. C-33. Incis. and enucleation; check hæmorrhage by lig.; sut. wound in liver by catgut No. 0 and Lister's silk, No. 1; deep and superficial sut., iii. C-25.

LUMBRICOIDS.

Naphthalin, gr. xv (0.97 grm.) after fasting, foll. by 2 tablespoon. *castor-oil*, i. F-10. *Santonin*, gr. viij (0.52 grm.); ext. *spigelia* and *senna*, ℥j (30 grms.) M. Sig.: One teaspoonful t. i. d., fol. by *castor-oil*, i. F-18.

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CYSTS, HYDATID. Inhala. *ether*, i. A-58.

HÆMORRHAGE. *Ergot*, hypoderm. inject. gr. xlvj (3 grms.); after hæmorrhage has ceased, gr. xxiij (1½ grms.) t. i. d. for 3 days, v. A-65. *Iron, quinine chlor.*, 10 drops 10 % sol., 5 or 6 times a day, v. A-91.

LUPUS. (See TUBERCULOSIS.)

If patient is free from other tuberculous manifestations, remove patch at once, cauterize with *thermo-caut*, *nit. silver* or *zinc. chlor.*, iv. A-39. *Fuchsin*, 1 % *alcohol* sol., appl. local.; intern., *cod-liver oil*, *iodine*, *hypophosphites*, or *iod. of starch*, iv. A-46. Galvano-puncture, v. C-20. *Aristol*, v. A-27. *Europhen*, v. A-69. *Chloride of gold*, intern., gr. 1-100 (0.00043 grm.), v. A-75.

SYPHILITIC. *Acid nitrate of mercury*, appl. local., v. A-97

MALARIAL FEVER.

PROPHYLAXIS. *Essence of cinnamon-oil* sprinkled on floor, v. A-53. *Quin. sulph.*, gr. v (0.32 grm.); *pulv. pepin. porc.*, gr. iij (0.19 grm.); *pulv. capsic.*, gr. ss (0.032 grm.); *pulv. zingib.*, gr. j (0.065 grm.); *sod. bicarb.*, gr. v (0.32 grm.). Sig.: Take ev. ½ to 1 hr. until fev. subsides; afterward half the quan. ev. 2 to 3 hrs. *Morph.* gr. ⅛ (0.0081 grm.) hypoderm. *Potass. permang.* i. H-60.

ACUTE. *Quin. hydrochlor.*, hypoderm. *Quin. sulph.*, gr. xvss (1 grm.); *aq. dest.*, ʒiiss (10 grms.); *tart. acid*, gr. vii¾ (50 c.grms.). Sig.: Use hypoderm. i. H-64. *Tinct.* or *ext. eucalyp.* *and quin.* with morning saline. *Methyl-blue*, gr. viiss (0.5 grm.) 6 hrs. bef. expected attack, and afterward gr. iss (0.097 grm.) five times daily, i. H-65.

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THERAPEUSIS.

Malarial Fever (*continued*).

Atypical. *Quin.* to cinchonism; give altern. ℨj *spts. ether. nit.*, and gr. ij to iij (0.13 to 0.19 grm.) of *potass. chlor.* ev. 24 hrs., i. H-63.

Chronic. *Iron*, *quin.*, and *stryrh.*, i. H-60. *Quin.* and *arsenic*, Warburg's tinct., change of residence, i. H-62.

Continued. Initial dose of *quin.*, then *carbol. ac.* and *potass. arsenite*, i. H-65.

Hæmaturia. *Tannin* and *quinine* alternately, i. H-60.

Pyrexia. Hand-spray of *spts. ammon. arom.*, ℨj (3.75 grms.); *sod. chlor.*, ℨj (3.75 grms.); aq., q. s. ad Oj (½ litre). Spray over one part of body at a time. i. H-20.

Serous Effusion. Tapping, fol. by inf. of *buchu* and *digitalis*; inject. of *port-wine*, i. H-60.

Splenic Tenderness. Innunct. of *red iod.-of-mercur. oint.* i. H-60. *Metamidophenylparamethoxychinolin*, v. A-98. *Pambotano*, v. A-109. *Phenacetin*, v. A-111. *Resorcin*, v. A-120.

Mastoid, Process, Diseases.

Mastoiditis, Primary. Leeches, ice. Wilde's incis., Schwartze's oper., Bergman's oper., iv. C-38. Wilde's incis., antisep. packing, iv. C-39. Appl. of *cold* by Leiter's coils. *Cupping*, or trephine. iv. C-39.

Measles.

Disinfect skin by *eucalyptus-oil* comb. with *camphor* or *thymol*, v. A-66. Cold bath, cold sponge, v. D-25.

Atypical. *Hydrarg. chlor. mit.*, gr. v (0.32 grm.); *pulv. morph. comp.*, gr. ij (0.13 grm.). Sig.: Ev. 2 hrs. i. I-18. *Calomel*, i. I-19. *Chlor. hydr.*, gr. iij (0.19 grm.); *syr. lactucar.* (Aubergier's), ♏xv (1.02 grm.); *aquæ*, ♏xlv (2.80 grms.). Sig.: Ev. 2 hrs. i. I-19.

For Pyrexia, *resorcin*, v. A-120.

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Manganese—H. S. Jacques, v. A-94.

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Measles—Bard, H. Méry, P. Boulloche, i. I-14; H. Gillet, J. B. Harris, i. I-15; G. F. Barnes, J. H. Hutchinson, i. I-16; Samuel W. Kelley, i. I-17; J. C. Wilson, i. I-18; C. H. Phillips, i. I-20.

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THERAPEUSIS.

MENINGITIS.

CEREBRO-SPINAL. *Iodol*, gr. iiiss (.22 grm.); *acetanilid*, gr. iiss (.16 grm.). Sig.: Ev. 6 to 8 hrs. *Iodol*., gr. ij (.13 grm.). Sig.: Thrice daily. ii. A-37.

MENSTRUATION, DISORDERS OF.

AMENORRHŒA. *Indigo*,℥ij (62 grms.); *bismuth*, ʒiv (15 grms.). Sig.: ʒss (1.94 grms.) in water t. i. d. ii. F-3. *Oxalic-acid*, gr. xv (0.97 grm.); *syr. orange-peel*, ℥j (38.5 grms.); *rain* or *distilled water*, q. s. ad ℥iv (120 grms.). M. Sig.: ʒj (3.75 grms.) ev. 4 hrs. ii. F-36. *Dioviburniæ*, ℥viij (240 grms.); *ferri et quin. cit.*, ʒiiss (7.78 grms.). M. Sig.: Dessertspoon. in water after meals. *Apiol*, *apioline*, ii. F-37. *Ferric brom.*, gr. iij to v (0.19 to 0.32 grm.), v. A-92. *Manganese*, v. A-94. *Oxalic acid*, v. A-108.

CONGENITAL. *Iron*, *potass. permang.*, *binox. mangan.*, and electric or faradic current, ii. F-3, 34. Galvanism. *Apioline*, gr. iij (0.19 grm.) t. i. d. for wk. preced. time of menstruat. Massage. ii. F-3, ii. F-35. *Tinct. sanguinaria Canaden.*, ʒj (3.75 grms.) t. i. d. and ℥ss (15 grms.) before retir., ii. F-3.

DYSMENORRHŒA. *Guaiacum*, *sulphur*, *ergot*, and *castoreum*. Rapid dilata. ii. F-6. *Oxalic ac.*, gr. xv (0.97 grm.).; *syrup orange-peel*, ℥j (38.5 grms.); *rain* or *aq. destil.*, q. s. ad ℥iv (120 grms.). Sig.: ʒj (3.75 grms.) ev. 4 hrs., ii. F-36. *Dioviburniæ*, ℥viij (240 grms.); *Ferri et quin. cit.*, ʒiiss (7.78 grms.). M. Sig.: Dessertspoon. in water after meal. ii. F-36, 37. *Apiol*, *apioline*, ii. F-37. *Antipyrin*, gr. xv (1 grm.) with *morphine*, gr. 1-6 (0.011 grm.), v. A-21. *Apioline*, ♏iij (0.18 grm.) in capsules, t. i. d., v. A-110. Galvanism, pos. pole on abdom.; vaginal electr., neg. pole, v. C-7.

CONGESTIVE FORM. Hot baths and douches: *bromides*; correct displacement, ii. F-6.

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MENTHOL—John J. Berry, Lennox Browne, v. A-94.

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METHYLAL—E. Marandon de Montyel, v. B-36.

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Menstruation, Diseases of (*continued*).

Dysmenorrhœa.

Neuralgic Form. *Viburnum prunifolium*, fld. ext., ʒj (3.75 grms.) t. i. d., begin 1 wk. before expect. mens.; or *apiol*, ♏iij to v (0.18 to 0.30 grm.), ii. F-6.

Pain. *Morph.*, hypoderm. inject., ii. F-6.

Stenosis. Goodell's dilat. by slow dival., ii. F-6.

In young girls, Vierordt's mechanical meth., ii. F-6.

Menorrhagia and Metrorrhagia. If hæmorrhage occurs after menopause, intra-uterine inject. of hot water, and follow with tampons of asept. absorb. cotton or *iodof. gauze, ice, sinapisms, opiates* or *ergot* internally. Jorissenne's treat., ii. F-4, 5. Electricity, ii. F-34. Duke's meth., ii. F-5. massage, ii. F-35. Tampon vag. with *iodof. gauze*, rest in bed, ice-bags. Intern. *fld. ext. hydrast Canaden.* Coe's meth., *electricity*. ii. F-5.

Profuse hæmorrhage, *iron-quinine chlor.*, gtt. x 10 % sol. 5 or 6 times a day, v. A-91.

Mesentery, Surgery of.

Lipoma. Laparotomy and complete enucleation. Tampon with *iodof. gauze*, fol. with *sublimate gauze*. iii. C-40.

Sarcoma. Laparotomy and complete remov., iii. C-37.

Serous Cysts. Abdominal sect. and remov. cyst. If cyst is adherent to intest. wall, leave adher. portion, lest the intes. wall rupture. iii. C-38. After-treat., pack with *iodof. gauze*; *salol* dress., iii. C-39.

Methyl Chloride, Anæsthesia by. Used locally, in short oper., as circumcision, cancer of lip, evulsion of toe-nails, incis. for empyema, tuberculous ulcers, and fistula, iii. P-19.

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Morphine—L. Guinard, v. B-36.

Morphinism—Watson, Lett, Nolder, Lefevre, Gittermann, Mattison, Fischer, Kaan, iv. I-1; Ball, Brazier, Mattison, Gorodichse, Mattison, Winston, Lambert, Tuck and King, Du Bois, Brannan, Wilbur, Clark, Colton, Mattison, iv. I-2; Mattison, Kiernan, Annual 1889. Guinard, iv. I-3; Amblard and Grasset, iv I-4.

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NASAL CAVITIES, ANTERIOR, DISEASES—CARCINOMA: Madeuf, A. E. Barker, A. Faidherbe, iv. D-13. CYSTS: C. W. Richardson, iv. D-13; H. Zwillinger, iv. D-5. EPISTAXIS: H. A. Rawlins, A. A. Philip, iv. D-18; W. W. Parker, J. C. Minor, W. H. Daly, iv. D-19; Saverny, Pogorelsky, T. Hubbard, iv. D-20; T. V. Fitspatrick, iv. D-21. FIBROMA: J. V. Ricketts, iv. D-13. FOREIGN BODIES: Berlioz, iv. D-16; Nitsche, Kelliher, J. A. Thompson, John Dunn, Kurz, iv. D-17. INSTRUMENTS: J. B. Ball, Pin, A. N. Strouse, G. A. Evans, C. A. Bucklin, iv. D-30; W. Hale White, Veeder, W. J. Walsham, H. de Haviland Hall, C. Niel Griffiths, iv. D-30; L. Jankau, Bresgen, G. C. Stephen, T. H. Weagly, T. Potter, Hopmann, iv. D-31. LUPUS: H. Krause, iv. D-10; E. E. Sattler, iv. D-11. MAGGOTS: R. W. Seary, W. H. Grayson, Küchenmeister, Delobel, Jacobsen, Brokaw, Allingham, iv. D-18. MISCELLANEOUS: Joseph A. White, M. Lermoyez, E. Fletcher Ingals, J. C. Mulhall, J. A. Thompson, W. Peyre Porcher, R. Beverly Robinson, John O. Roe, iv. D-31; Harrison Allen, G. Delotti, E. J. Brown, J. Gradenigo, J. Macintyre, A. Ames Bliss, Bayer, J. E. Bullock, iv. D-32. NEUROSES: Kurt, Peltesohn, Jacobi, Winckler, Botey, William Davis, iv. D-26. APROSEXIA: Guye, Raulin, iv. D-27. ANOSMIA: Gottschalk, iv. D-27. PAPILLOMA: J. Wright, Hopmann, iv. D-14; Noquet, Hopmann, Schech, Schaeffer, iv. D-15. POLYPI: Woakes, Walsham, Hill, Lennox Browne, Stepanow, B. Lewy, iv. D-11; Natier, Grossard, Moure, Le Roy, Kurz, A. Marmaduke Shield, W. E. Casselberry, iv. D-12. ATROPHIC: J. Wright, Christovitch, Arnold, iv. D-7; Löwenstein, W. C. Braislin,

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MALARIAL. *Quin.*, gr xx to xxx (1.30-2 grms.) at a dose, ii. C-62.

NEURASTHENIC. Forced feed. and rest, ii. C-62.

PERIPHERAL. Galvanism, anode over seat of pain; cathode indiff. 5 Ma. 5 to 10 min., v. C-5.

SCIATIC. *Sod. salicyl.* and *potass. iod.*, *aconite*, *belladonna*, and *gelsemium*, nerve-stretching. Rest by a splint, and dry cold over nerve, actual cautery, ii. C-71. Nerve-stretching, iii. A-57. Cathode over swollen m., anode over thigh, v. C-3. *Euphorin*, v. A-67. *Phenacetin*, gr. xv (0.97 grm.) ev. hr. for 4 hrs., v. A-112. *Salipyrin*, v. A-126.

SUPRA-ORBITAL. *Antipyrin*, gr. viij (0.52 grm.) with *morphine*, gr. ⅛ to 1-6 (0.008 to 0.011 grm.), v. A-21. *Euphorin*, v. A-67. *Cocaine* by cataphor.; also *chloroform*, *helleborin*, and *aconitia*, the latter combined with *cocaine*, v. C-2.

TEMPORAL. *Chloride of ethyl* appl. local., v. A-66.

TRIGEMINAL. Resection of nerve, ii. C-66. *Aconitine*, rest, and over-feeding; *nitro-glycerin*, *aconite* and *iodide*; removal of periph. nerve, ii. C-67. *Quinine*, *antipyrin*, *antifebrin*, *iodine salts*, galvanization, *methylene-blue*, in two 5-gr. (0.32 grm.) caps., t. d., and *if strangury* results use *nutmeg*, ii. C-68. *Cocaine* subcutan., ii. C-70. Nerve-stretching, iii, A-53. Remov. of Gasser. gang. by trephining, iii. A-52. Resec. at exit from skull, iii. A-51. Andrews' method of remov. Gasser gang., iii. A-53, 54. *Aconitine*, ii. C-63.

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Psychical. Light work, isol. from one's family. *Iron* and *arsenic*. *Stat. elect.* by electrode pass. into the stomach, ii. C-53.

Respiratory. Approp. diet and regimen. No alcohol. Cold or tepid spong.; active exercise; sed. appl. to throat. Tonics, ii. C-47.

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Paralysis. Electricity; massage and stimulating baths, ii. L-23.

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Tetanus.

Prophylaxis. Antisep. of umbilicus, with *peroxide of hydrogen* and *beta-naphthol*; dust *iodoform* on surface, ii. L-23. Internal, *beta-naphthol*, gr. j (0.065 grm.) every half-hour; *chloral hydrate*, gr. j (0.065 grm.) every hr.; *pot. brom.*, gr. iij (0.19 grm.), by rectum, ii. L-24.

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Omentum.

Tumors. Warm fomentations over tumor, absorb. inunct. Rest, esp. of bowel. Opiates. iii. C-35. Laparotomy, iii. C-36.
Closing of Wound. If very fat person, first by Czerny-Lembert sut. (catgut), the fascial and muscular lines with silk, or pack external wound with *sublimate gauze*. If hernia occurs, use hard-rubber truss. ii. G-41, 42.

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Ovaritis. If pre-existing uterine affection, curette uterus: correct displacements; rest, physical and sexual: good nutrition; regulate bowels, and uterine massage; *ichthyol*, intern., ii. G-22. Ovariotomy, ii. G-16. *Dioscorea ext.*, gtt. x to xx, alternating ev. 2 hrs. with *bryonia*, ii. G-22.

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Hæmatoma. Laparotomy; incise tumor; remove contents: pack with gauze: stitch walls: edge of incis. brought up to post. wall of uterus by sut. to abdom. wall through sac. peritoneal coat of uterus and opp. edge of sac and abdom. wall, ii G-27.

Oxaluria.
Pot. permang., gr. viij (0.52 grm.) in ℥ij (60 grms.) of water, give teaspoonful t. i. d., i. L-130.

Oxyuris Vermicularis.

Tinct. rhubarb, gtt. xx; *magnes. carb.*, gr. iij (0.19 grm.). *Tinct. ginger*, gtt. j: *water*, ʒiij (11.25 grms.). Sig.: One dose. *Pot. acet.*, ℥iss (45 grms.); *tinct. fer. chlor.*, ℥j (31 grms.); *water*, q. s. ad. ℥viij (240 grms.). M. Sig.: One tablespoon. in water t. i. d., 1 hr. after meals. *Aloes* and *fer. carb.*, āā gr. j (0.065 grm.) in pill, at bed-time, i. F-13. Inject. *quassia* chips (pwd.), ℥j (31 grms.) to Oj (½ litre) of water, or inject *carbol. acid* ½ to 1 drop to ℥iv (120 grms.) of water, i. F-15. *Calomel*, gr. iij (0.19 grm.), and *mucil. of flaxseed*, ℥iv (120 grms.) in emul. One dose. *Sulphurett. pot.* ʒiiss (9.72 grms.) to ℥iv of water, *naphthalin*, gr. xv (0.65 grm.): *olive-oil*, ℥iss (56.00 grms.). Sig.: Inject. i. F-15.
If worms are in the lower part of the intestine, Cruveilhier's treat., i. F-15.
If high up in Intestine, *calomel* and *santonin*. *Calomel*, ʒj (3.89 grms.); *vaselin*, ʒiij (14.06 grms.). M. Suppos. i. F-16. Farquhar's formula, i. F-14. *Salol*, gr. v to viij (0.32 to 0.52 grm.), at bed-time. Rectal inject. *sod. chlor.* sol. or *boroglyceride* (1 to 20), fol. by supp. of *boroglyceride*. *Fld. ext. spigelia*, comb. with *senna*, to

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OXYURIS VERMICULARIS (*continued*).

be given in morn., fol. at night with *castor-oil*. *Infus. absinthum*. *Cold-water* inject. Astring. inject. *perchlor. iron* and *lime-water*, i. F-14. *Lime-water*, ℥iv (120 grms.); decoct. *marsh-mallow*, ℥j (30 grms.); inject. *Tannic acid*, gr. xv (0.97 grm.), in suppos. Inject *asafœtida*, or intern. *alcohol. ex. of senna*, gr. xxx (1.94 grms.) in boil. water, ℥iv (120 grms.); make infus and sweet. with *syr. wild cherry*. Sig.: One dose, fol. by *magnes. sulph.*, i. F-15.

OZÆNA.

Aristol, gr. xl (2.5 grms.) to the ounce (31 grms.) of *liq. petrolatum*, v. A-27. *Chlorphenol inhal.*, v. A-53. Inhal. *perox. hydrogen*, v. A-78.

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AGITANS. *Hyoscine*, gr. 1-100 to 1-300 (0.00022 to 0.00065 grm.). *Hypnotism*, v. A-81. *Nitrous-oxide gas*, v. A-102. FOR TREMOR, *hyoscine*, gr. 1-100 (0.00065 grm.) twice daily, ii. D-31.

ALCOHOLIC. *Antipyrin*, gr. c (6.48 grms.) a day. Therm. baths. ii. C-18.

FACIAL. Acupunct., comb. with weak farad. curr., ii. C-8.

FUNCTIONAL. Elec., hypnot. suggest., ii. A-27.

INFANTILE. Hydro-electric baths, v. C-7. Craniectomy, ii. A-25.

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IF ACUTE ENCEPHALOPATHY, *nitrite of amyl*, ii. C-17.

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TRAUMATIC, or RHEUMATOID. Galvanism, v. C-6.

PAROTITIS.

Hagopoff's method of treat. Purgatives, as *castor-oil* and *Hunyadi water*, i. J-22.

IF ORCHITIS OCCURS, envelop test. in cotton, and elev. to abdom., i. J-22.

PELVIC CONNECTIVE TISSUE, DISEASES.

ABSCESS. Rest: no *opium*; *magnes. sulph.*, or *Seidlitz powd.*, in small and repeated doses, ii. F-32.

IF ABSCESS HAS FORMED, open abdom.; vagin. hysterectomy; Terrillon's trephining meth., ii. F-32.

IF ABSORPTION BEGINS, *canth.* blisters over tumor, ii. F-32.

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For pyrexia, laxatives, *cantharides*, blisters over sensit. spot, and firm abdom. band., ii. F-33. Laparotomy, iii. C-41, 42.
In chronic cases, permanent drainage, iii. C-43. Paracentesis, iii. C-44.
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Post-Operative Traumatic. Open wound, thoroughly wash out the abdom. cav. with 5 qts. (5 litres) *boric acid* sol. and 1 qt. (1 litre) of *carbol. acid* sol.: extern., *corros. sub.* compresses and cold, iii. C-44.

Peritonitis, Tubercular. *Opium* to narcosis, with small dos. of *calomel*. *Mercur. oint.* appl to abdom. twice daily. *Salines*. i. D-24. Laparotomy, wash. out cav., and close. If effusion again occurs, inject. *dog's serum*, i. D-23. Laparotomy, iii. C-43, 45. Konig's meth., iii. C-45, 46. Paracentesis, iii. C-48.
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THERAPEUSIS.

PERTUSSIS.

Thym. vulg., ℥iii ½ (100 grms.); *aq.*, Oss (250 grms.); *syr. moræ*, ℥i¾ (50 grms.). Sig.: 1 tea- to 1 tablespoonful accord. to age of child, 8 to 12 times daily, i. J-19. *Benzol*, ♏ij (0.13 grm.), in mucilage for child 6 mos. old, and ♏v (0.32 grm.) for adult. *Antipyrin*, gr. ij (0.13 grm.) ev. 3 hrs. until effect is obtain.; then ev. 4 or 5 hrs. *Ac. carbol.*, gr. vj (0.39 grm.); *menthol* (4% sol.), ʒiv (15.0 grms.); *cocaine* (3% sol.), ʒiij (11.66 grms.); *glycerine*, ʒj (4.70 grms.); *aq. lauroceras.*, ℥j (30.0 grms.). M. Sig.: Use with atomiz. Sejournet's meth., i. J-20. *Bromoform.* *Ouabaine*, gr. 1-1000 (0.00065 grm.) ev. 3 hrs. to child under 5 yrs. *Quinine.* *Naphthalin*, ʒiv to v¼ (15 to 20 grms.), sublimed in the room or intern.; ½ to 2 grs. (0.032 to 0.13 grm.) ev. 2 to 4 hrs., accord. to age, i. J-21. *Iodoform vapor; ozone* by inhala.; *essen. ol. cypress* by inhala., i. J-21, 22. *Argent. nit.* by insuffl. daily, i. J-22. *Antifebrin*, v. A-2. *Anemonine*, v. A-13. *Antipyrin*, gr. xxiij to xxxviij (1½ to 2½ grms.) in 24 hrs., v. A-22. *Bromoform*, gtt. ij (0.13 grm.) after meals, v. A-41. *Bryonia* combined with *drosera*, v. A-42. *Chloroform*, v. A-52. *Hydrogen perox.*, v. A-77. *Ozonic ether*, ♏x to lx (0.60 to 3.38 grms.) in dil. *alcohol* ev. 4 hrs., v. A-77. *Oxygen*, v. A-109. *Resorcin*, v. A-120.

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THERAPEUSIS.

Phlegmasia Dolens.

Cold-water compress. and ice-bag; *Cannabis Ind.*,, ii. K-14.

Pityriasis.

Ichthyol, intern., gr. xv. (0.97 grm.) a day; local., *ich.* comb. with *lanolin*, *zinc oint.*, or *glycerin*, 5 to 50 %, v. A-86.

Placenta Prævia.

Dilate vag. by colpeurynter, or *iodof.* gauze; irrig. with 1 to 3000 *cor. sub. sol.*: introd. fingers into dilat. cerv.; perform version by Braxton-Hicks' meth., and bring down extrem., which will act as tampon, ii. J-8. Barnes's meth., ii. J-9. Braxton-Hicks' meth., ii. J-9,10. Meth. of combined version, ii. J-10.

For hæmorrhage, *ergotole*, ♏x (0.60 grm.), hypoderm., ii. J-12. *Hydrast. Canaden.*, ii. J-13.

Plethora.

Strontium lactate, ʒiss to iiss (6 to 10 grms.) daily, v. A-132.

Pleurisy.

Early treat.; *calomel* and *digital.*; draw off fluid with aspirator; wash out cav. with *antiseptic sol.*, as *boric acid sol.* If this fails, incision. If necessary, resect rib. i. A-13, 14, 15. Massage to promote absorp. of exudate. *Soda salicyl.* *Antipyrin*, gr. xiiiss (1 grm.) ev. 4 hrs., i. A-15.

Chronic. *Caffeine*, v. A-43. *Euphorin*, v. A-68. If exudation has taken place, *mustard sinapism*, v. A-100.

Pneumonia.

Calomel, *aconite*, *verat. virid.*, i. A-6, 8. *Antifebrin*, v. A-1. Cold over cardiac reg., v. D-29.

For congestion, *ammon. carb.*, *brandy*, and *digitalis*, *mustard baths*, and cotton jacket over chest, i. A-8.

For delirium, cold to head; *pot. brom.* or *sod.*; *chloral hyd.* or *paraldehyde* and *aconite*; abstraction of blood by leeches behind ears, i. A-9.

For fever, *acetanilid*, gr. j (0.065 grms.) ev. 2 or 3 hrs., i. A-8.

If anæmic, *opium*, *sulphonal*, and *chloral hyd.*, i. A-9.

If diabetes, *caffeine*, gr. xvss (1 grm.), hypoderm. per day; milk, 2 or 3 qts. a day; *quinine sulph.*, gr. xxiii¼ (1½ grms.) per day; revulsion to chest, i. A-8. Cold compresses or baths, i. A-8.

In first stage, blisters, i. A-8. *Veratrum viride*, v. A-141. *Antipyrin*, v. A-21. *Chloroform*, v. A. 52.

In infants, *stimulants*, respiratory and cardiac, i. A-8.

If infectious, *quinine*, *carbol. acid*, or *creasote*, i. A-9.

If weak heart, *strych.*, gr. 1-25 (0.0026 grm.) hypoderm ev. 6 hrs., i. A-6. *Digitalis* in decided doses, gr. clxxx (11.66 grms.) of the leaves in 24 hrs., i. A-6; or hot *infus. digitalis*, tablespoon. ev. hr., comb. with *calomel*, gr x (0.65 grm.) at begin., i. A-7. *Chloral* and *digitalis*, i. A-7.

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Pinoñcillo—Grosourdi, Semeleder, v. A-114.

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THERAPEUSIS.

PNEUMONIA (*continued*).

CROUPOUS. *Cocillaña fld. ext.*, ♏ xxx to lx (1.87 to 3.75 grms.) ev. 2 to 4 hrs., v. A-56. *Digitalis*, gr. lx to xc (3.89 to 5.83 grms.) during 24 hrs.; contra-indicat. in sec. and third stage, v. A-60. *Euphorin*, v. A-68. *Mustard sinapisms*, v. A-100. Subcutan. inject. *nascent oxygen*, v. A. 105.

FIBRINOUS. *Caffeine*, v. A-43. *Camphorated oil*, ♏ xv (0.97 grm.), hypoderm., v. A-43. *Eucalyptol*, ♏ v to x (0.32 to 0.65 grm.) ev. 4 hrs., v. A-66.

POLLAKIURIA. Inject. of graduated amt., sterilised water into bladder. Regulate hrs. for micturition. Local and general sedatives, i. L-101.

POST-PARTUM HÆMORRHAGE.
Faradism, v. C-16, 17 (see Labor).

POTT'S DISEASE.

Traction. iii. G-7. Sayre's plaster jacket: if jacket cannot be worn, traction in bed by head-straps, weights, and pulley, or wire cuirass.

IF PARAPLEGIA, traction and counter-irrit. before resection of laminæ, iii. G-8. Hadra's meth., iii. G-2, 3. McCurdy's corset, iii. G-6. In up. dorsal and cervical, jury-mast, iii. G-7. *Aërotheraphy* and *salt-water* baths, iii. L-3.

PREGNANCY, DISEASES OF.

COMPLICATIONS.

HYDRÆMIA. *Ferric brom.*, gr. iij to v (0.19 to 0.32 grm.), v. A-92.

LUNGS, ŒDEMA, SECONDARY TO NEPHRITIS. *Nitro-glycerin* hypoderm., ii. I-18.

UTERINE FIBROIDS. If pedunculated, remov. by Sänger's or Porro's oper., ii. I-9. For gunshot wound, laparotomy *at once*, ii. I-10.

VOMITING. *Brom. of potass., sod.*, and *ammon.* *Iodine*, gtt ij to iij, t. i. d. in boiled water. *Creasote*, ♏ xxx (1.94 grms.); *tr. gentian*, ʒiiss (9.62 grms.); *ext. coffee* (Germ. Pharm.), ʒiiss (9.62 grms.); *brandy*, ℥j (30. grms.); *aq. destil.*, ʒiiiss (105 grms.). Sig.: 1 teaspoon. in milk t. i. d. Appl. of *arg. nit.* to cerv. erosions. Paint cervix with *iod. paint* (p. e. *iod.*, *potass. iod.*, *spts. wine*, and water); Tureaud's meth.; *Chatel-Guyon* water, ii. I-16. *Arsenic*, Auldo's formula, v. A-30. *Hypnotism*, v. A-8. *Resorcin*, v. A-121.

PREGNANCY.

EXTRA-UTERINE.

IF CHILD IS VIABLE, laparotomy; stitch sac to abdominal wall; pack with *iodoform gauze*; wait for spontaneous expul. of placenta, ii. G-53. Early removal of ovum by abdom. section, ii. G-54.

IF SAC RUPTURES, abdominal section at once, ii. G-52; ii. G-54.

IF SAC IS SUPPURATING, vaginal op. pref., ii. G-56.

IF SAC OR FŒTUS FORMS TUMOR AT POSTER. VAGINAL WALL, vaginal op. indicated, ii. G-55.

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THERAPEUSIS.

PREMATURE LABOR.

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PRURIGO.

Ichthyol, intern., gr. xv (0.97 grm.) a day; local., *ichthyol*, comb. with *lanolin*, *zinc oint.*, or *glycerin*, 5 to 50 %, v. A-87.

PRURITUS.

Creolin, 3 to 5 pts., in 100 pts. *linseed-oil.*, appl. 3 or 4 times a day, iv. A-49. *Sod. bicarb. and lith. carb.*, v. A-12.

SENILIS. Faradic curr., v. C-19.

PSILOLIS (SPRUE).

Rest in recum. pos., *castor-oil*, with *tinct. opii*; Enem. at bed-time, i. H-74. FOR FLATULENCE, hot foment.; milk diet, with or without *lime-water*; nourish, in small quant. and frequently; *santonin*, gr. v (0.32 grm.) in ʒj *olive-oil*, morn. or even. for 6 days, i. H-74.

PSORIASIS.

Aristol, v. A-29. *Gallacetophenon*, v. A-73. *Ichthyol*, intern., gr. xv (0.97 grm.) a day; Local., *ichthyol* comb. with *lanolin*, *zinc oint.*, or *glycerin*, 5 to 50 %, v. A-86. *Uralium*, v. A-140.

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FOR FISSURED NIPPLE. Hirst's meth., ii. K-15. Nurse child from other breast, and draw milk from affected breast until cured, or use glass nipple-shield, with rubber tip, ii. K-16.
FOR ENGORGEMENT AND PAIN, appl. of *lead-water* and *laudanum*, ii. K-16.
TO ARREST SECRETION OF MILK. *antipyrin*, gr. iv (0.26 grm.) ev. 2 hrs. until gr. lx (3.89 grms.) have been taken. ii. K-15.

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Peritonitis.

In fresh parametritic exudations, Fritsch's meth., ii. K-5.

Septicæmia. *Sod. chlor. sol.* int., sponging body with *ether* and subcutan. insert. of *pilocarp.*, gr. 2-13 (.01 grm.) twice daily, ii. K-3, 4.

In earliest stages, intra-uter. irrig., with [illegible] *sol.* [illegible] ʒj (3.89 grms) to [illegible] litre of water, repeat every 6 [illegible] *arsenit.* intern., with [illegible] for bowels, *turpent.* to abdom., and antisep. douche, t. i. d. Curette uterus early, then wash out and tampon with *salol. gauze*. Cœliotomy and irrig. of abdom. cav., ii. K-4.

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Rectum, Diseases of.

Cancer. *Salol*, 10 parts; *olive-oil* and *water*, each 60 parts, v. A-126. Extirpation, sacral method, iii. D-21.

Hæmorrhoids. Daily action of bowels; cold sponging; vegetable diet; daily exercise iii. D-1. Cold-water injections, iii. D-2. Operative procedure: clamp and cautery; ligature, iii. D-3. Replacement of uterus, if due to retroversion, iii. D-10. Neg. galvan. curr., 20 ma. for 45 min., v. C-10.

Proctitis, Catarrhal. *Boracic acid* inject.; *bismuth sub. nit.*, gr. xv to xxx (1 to 2 grms.); *zinc oxide*, gr. j to x (0.065 to 0.650), iii. D-10.

Prolapsus. Verneuil's op., dissect down from behind in median line, gathering into transverse folds by sutures, attaching same to sides of coccyx and sacrum, iii. D-3.

Stricture. Dilatation; divulsion; incision; excision; colotomy; extirpation by sacral method, iii. D-17.

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THERAPEUSIS.

RHEUMATISM.

ACUTE. *Salicylates* and *alkalies*, aided by *salol* and *phenacetin*; vegetable and milk diet; "infuso-decoction" of *ephedra vulgaris*, ℥ss (16 grms.) every 2 hrs., i. K-7.

FOR HYPERPYREXIA, cold bath and wet-pack, i. K-7.

FOR PAIN, hypodermatic inject. of 10 % sol. *carbolic acid*, ♏v to x (0.32 to 0.65 grm.) near inflamed structure; locally, warm 4 % sol. *carbolic acid*, i. K-7. *Salipyrin*, gr. xv to ʒiss (1 to 6 grms.), i. K-8; v. A-126. *Diuretin*, ʒi¼ to iiss (5 to 10 grms.) in 24 hrs., to be given in warm water, between meals, v. A-62. *Europhen*, gr. iij (0.20 grm.), increase to gr. vj (0.40 grm.), t. i. d., v. A-68. *Exalgin*, gr. iv to xij (0.26 to 0.78 grm.), v. A-71. Galvanism, v. C-11. Hypnotism, v. A-81. *Antifebrin*, v. A-1. *Common table-salt*, applied local., v. A-8. Small amt. *nitrogenous food*, v. A-9. *Methyl-blue*, gr. iii 1-10 (20 c.grms.) in 24 hrs., v. A-14. *Methyl-blue*, v. A-17. *Antipyrin*, v. A-21. *Cimicifuga*, v. A-53.

FOR PYREXIA, cold-pack, and spinal ice-bag, v. D-27. "Gaertner's local steam bath," v. D-32.

CHRONIC. *Cactus*, in form of jelly, in ʒj dose (4 grms.) twice daily for 10 days, increased to ʒij for 1 wk. longer, i. K-8. *Ammon. chlor.*, v. A-13. *Cimicifuga*, v. A-53. *Ichthyol*, v. A-86. *Rhus toxicodendron*, v. A-122. *Salipyrin*, v. A-126. *Salol*, v. A-127. Carbonated baths, v. D-19. Carlsbad min. water, v. D-13. Hot 3 % *sod. chlor.* bath, v. D-19. Innot Springs, v. D-14. Hot sand baths, tepid aromatic baths, v. D-16. Luxeuil thermal waters, v. D-20.

GONORRHŒAL. Wrap joint in Vigo's mercurial plaster, cover with cotton-wool, i. K-8. *Mercurial friction*; subcutan. inject. *bichlor. mer.*, v. A-97. Subcutaneous inject. of *bichlor. mercury*. gr. 1-64 (0.001); touch several points with cautery, i. K-8.

MUSCULAR. *Ammo. chlor.*, v. A-13. *Europhin*, gr. iij to vj (0.20 to 0.40 grm.) t. i. d., v. A-68. *Phenacetin*, v. A-3. *Phenocollum hydrochlor.*, v. A-112.

FOR PAIN, *pyrodin.*, v. A-115.

FOR PYREXIA, *tinct. cinchona*, ℥ss (11.66 grms.) ev. 4 hrs., v. A-118.

POLYARTHRITIS, ACUTE. *Salicylate of sod.*, v. A-125.

IF DIARRHŒA OR VOMITING, *salol*, v. A-125.

FOR SWELLING, *sol. chloride*, *benzoate* or *citrate lithium*, by *cataphor.* (anode), v. C-3.

SUBACUTE, ARTICULAR. Stabile galvan, 10 Ma. for 15 min., applied to joints. v. C-12.

RHINITIS.

ACUTE. *Euphrasia officinalis*, a few drops in water; *gelsem. fld. ext.*, ♏ x (0.66 grm), iv. D-3. *Camphorated oil*, hypoderm., v. A-43. *Cocillaña*, app. local, v. A-56. *Hydrast. Canadensis*, v. A-76. Inhal. *hydrogen perox.*, v. A-78. *Cosmolin*, local, in nostril, v. A-110.

ATROPHIC. *Thymol*, aq. sol., gr. ss to iss (0.032 to 0.097 grm.) to ℥j (30 grms.); first cleanse with *alkaline sol.*, then appl. by means of spray, iv. D-7. Arnold's meth., iv, D-7, 8. *Ichthyol*, 5 % sol. in *keroline*, appl. with cotton-wrapped appl., then spray with *keroline-ichthyol*, 3 to 5 pts. of *liq. alboline*; *aristol*, in pwd., or gr. xxx (1.94 grms.) to ℥j (30 grms.). Sig.: Spray. iv. D-8. Demme's massage treat., with 20 % *pyoktanin-lanolin oint.*, iv. D-9.

HYPERTROPHIC. Galvano-caut., iv. D-4. Modif. Weir's scissors, iv. D-5. *Camphor-thymol*, 25 % sol. in *lanolin*, apply local., iv. D-28. *Chromic acid*, v. A-53. *Trichloracetic acid*, v. A-139.

SYPHILITIC. Local *merc.* appl.; *hydrarg. oleatis* (5 %) ʒj (4 grms.); *al-*

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THERAPEUSIS.

Rhinitis, Syphilitic (*continued*).

boline, ℥ij (64 grms.). M. Sig.: Appl. small quant. twice daily, or aqueous sol. *hydrarg. bichlor.*, gr. j (0.065 grm.); *ammo. mur.*, gr. vj (0.39 grm.); aq. destil., ℥ij (60.00 grms.), iv. D-9. *Chromic acid*, v. A-53.

Ulcerative. *Aristol*, in pwd. or ointment, v. A-28.

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Scabies.

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To accelerate desquamation, wash daily with soap and water, and apply *carb. ac.* (3 %) in oint. or oil, i. I-12. *Resorcin salicyl. soap* (3 %), used with warm water, dry and apply *olive-, almond-, or pure whale-oil*, i. I-12, 13. Cold [illegible] 6 to 8 times a day, or cold bath to [illegible] min., v. D-26. *Chloroform* as antisept. wash, v. A-52. *Eucalyptus-oil* in comb. with *camphor* or *thymol*, appl. local., as a disinfect. of the skin, v. A-66. *Resorcin*, 10 % sol., appl. to skin, v. A-120.

Ulcerated Throat. Rubber-bag syringe, accord. to age of pat.; *boric-ac. sol.*, i. I-11. Hypoderm. inject. *corros. sublim.*, gr. 2-13 (0.01 grm.); irrig with *chlorine sol.*; irrig. with *boric-ac. sol.*, i. I-12.

Scorbutus.

Out-door life: fresh milk sterilis.; beefsteak juice; sweet oranges; *tr. fer. chlor.*, i. M-12. *Milk, alcoh., tr. [illegible]*; avoid food rich in *potass.*, ii. E-18. Small amt. nitrogenous food, v. A-9. Glycerin-jelly by rectum,, v. A-10.

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Ataxia. Regular exercise; *hyposulphite* of *sodium* and *silver*, gr. 4-5 to iii 1-10 (5 to 20 centigrams.), ii. B-30. Hypoderm. inject. Koch's *tuberculin*. every 2 days for 3 wks., ii. B-31.

With inco-ord. and anæsthesia, hypoder. inject. Poehl's *spermin*; hypoderm. inject. of Brown-Séquard's *testicular fluid* (?), ii. B-31. Hypnotism, ii. B-32. Suspension treat., ii. B-35, 36. Cold water as a cutaneous irritant, applied to lower extrem. for one-quarter to one min., followed with heat, ii. B-37, 38.

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DYSPEPSIA. Chalybeate waters, v. D-15, 16, 19. Thermal baths; massage, electricity, change of climate, v. D-17. *Aristolochia Mexicana*, v. A-29. *Cocaine*, v. A-55.

ANÆMIC. *Iron* at beg. of meal and *hydrochlor. ac.* at end. *Soda hyposulphite*, gr. v. (0.32 grm.). Cadogan's formula, v. A-86. *Iron*, subcutan. inject., v. A-92.

ATONIC. *Oxygen*, i. C-18. For hyperacidity with or without dilatation, *strontium brom.*, gr. xxx–ʒj (2-4 grms.) dur. course of each meal. If nervous vomiting, add *Cannab. Ind.*, i. C-19.

CHRONIC. Massa. 2-3 hrs. after principal meal of the day, i. C-10. *Ac. sulph.* (pur.), 28 pts.; *ac. nitr.* (pur.), 8 pts.; *spts. rectif.* (80%), 180 pts. Sig.: Mix gradually in ice, give gtt xx after meals, i. C-10. *Menthol*, v. A-94. For chloro-anæmia, *album.* of *iron sol.*, i. C-10.

FOR PAINFUL DIGESTION, *strontium brom.*, i. C-19. Alkaline medication, with sedatives, narcotics, *chlorof.*, *cocaine*, *condurango*, *cannabis*, etc., i. C-8.

GOUTY. *Halviva*, v. A-76.

NERVOUS. Galvanism, cathode on epigastrium; anode at back of neck, 10 to 30, even 50, ma. If combined with neurasthenia, general faradization, v. 6-5. *Menthol*, v. A-94.

RHEUMATOID. Hygienic precaut., *sulpho-nit. acid; mineral waters*, i. C-9.

WITH HYSTERIA, hydrotherapy, or Weir Mitchell meth., i. C-8.

FOREIGN BODIES. Potato treatment, i. C-17.

GASTRALGIA. Galvan., neg. pole in stomach, 15 to 20 Ma. for 10 min., 2 to 3 times a wk., v. C-10. Constant farad. curr., v. C-25. *Menthol*, v. A-94. *Antipyrin*, v. A-21. *Cannabis Ind.*, combined with *nitrate silver*, v. A-45. *Exalgin*, gr. 4-5 to iss (0.05 to 0.10 grm.), t. i. d., v. A-71.

HYPERACIDITY. Farad. curr.; *alkalies*, v. C-25.

ULCER. *Amm. chlor.*, v. A-13. *Cannabis Ind.*, comb. with *silver nitrate*, v. A-45. Saundby's meth., i. C-15. If hæmorrhage occurs, suck ice; rectal feeding, i. C-15. *Perchlor. iron* and *tannin* in *mucil. sol.*, i. C-14. *Morph. sod. bicarb.*, *bism. subnit.*, with *quinia*, i. C-14.

FOR VOMITING, absol. rest; milk diet; no hot drinks or *alcoh.*, i. C-14.

WOUNDS. Anodynes and rectal feeding; *laudanum;* milk and soda for thirst; keep pat. quiet, iii. C-4.

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THERAPEUSIS.

STOMATITIS.

DIPHTHEROID. Appl. of *iodoform.*, i. C-2.

APHTHOUS. *Prophylaxis;* Antisep. washes, as *boric ac.*, gr. xlvj (3 grms.); *tr. myrrh*, gr. xxxj (2 grms.); *water*, ℥viss (200 c.cm.), i. C-2.

SYCOSIS.

Ichthyol, intern., gr. xv. (0.97 grm.) a day; local. comb. with *lanolin*, *zinc oint.* or *glycerin*, 5 to 50 %., v. A-56.

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ABORTIVE TREATMENT. Excis. of chancre, iii. F-19, 20. *Cautery*, iii. F-20, 22 24. *Charcoal* and *sulphuric acid;* Canquoin's paste; 3 % sol. *silver nit.*, t. i. d.; appl. by means of tampons absorb. cott., iii. F-22. Antiseptic washes: *oxygen water;* sol. *chloral* or Labarraque's sol., iii. F-22. If mucous patches on conjunctiva, local. appl. 1-2000 *sublimate* sol.; intern., *iod. potass.*, iii. F-8. After-treatment, *sod.* and *pot. comp. sozoiodol*, v. A-132.

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THERAPEUSIS.

SYPHILIS (*continued*).

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CEPHALALGIA. *Iod. pot.*, gr. xl (2.59 grms.) daily, iii. F-29.

IN NEWBORN, appl. gr. xxxj (2 grms.), increase amt. with severity of case; appl. on thorax just bel. axilla., one side at time, iii. F-32. Jelk's meth., ʒj (3.97 grms.) of 50 % *mer. oint.* appl. ev. night; or *mer. protiod.*, gr. ¼ (0.016 grm.), iii. F-32. *Iod. pot.*, gr. xv (0.97 grm.), t. i. d.; increas. gr. j (0.065 grm.) a day until full physiol. eff., iii. F-32.

LARYNGEAL, WITH DYSPNŒA. *Pot. brom.*, comb. with *mer.*, iii. F-37.

OF MUCUOUS MEMBRANE, *euphorin* in pwd., salve, or *alcoh. sol.*, v. A-68.

OF NERVOUS SYSTEM, prophylaxis, excis. of primary sore; after secondary symp., 3 mos., *mercurial treat.* Hypoderm. inject. *carbolized mercury cream*, iii. F-33.

PULMONARY. *Pot. iod.*, i. A-57.

FOR PURPURA, WITH ALOPECIA, *euphorin*, in *pwd.*, *salve*, or *alcohol sol.*, v. A-68. Secondary lesions, *europhen*, local and hypoderm. v. A-69. Galv. curr., iii. F-23.

HEREDITARY. Strict hygiene; *mercur.* innunct. and baths; Van Swieten's liquid: Gilbert's syr., ii. A-54. *Mercur. perchlor.*: subcutan. inject., ii. A-55. Van Swieten's sol. and innunct.; inject. *bichlor. mercury*, iii. F-18.

HYPODERMATIC MEDICATION. *Hydrarg. thymolo. acet.*, gr. xxiiiss (1.50 grms.): *mucilag. gum. arab.*, gr. vii¾ (0.50 grm.): *aq.*, ʒv¼ (20.00 grms.). M. Sig.: Inject gr. i 1-6 (0.075 grm.) in gluteal region, iii. F-33. *Merc. bichlor.*, with *sod. chlor.* in water, iii. F-34. Eich's meth., *salicylate of merc* suspend. in *liq. paraffin*, 1 to 10; cleanse skin; inject. gr. iss (0.1 grm.) weekly in gluteal reg., iii. F-34. *Merc. bichlor.*: first mix with *vaselin*, then suf. *oil of vaselin* to make emuls. cont. 22 % of *merc. bichl.* inject, iii. F-35.

CONGENITAL SYPHILIS. Hypoderm. inject. *gray oil*, *merc.* prepar., iii. F-35. *Sublimat. sol.*, gr. 1-64 to 1-32 (1 to 2 milligrms.), Kronfeld's electric baths, iii. F-36.

TERTIARY. Friction ev. day with ʒij (7.78 grms.) *mer. oint.* To control spasm, small doses *pot brom.*, iii. F-37; fol. by eq. pts. *iod.* and *brom. pot.*, iii. F-38. ERUPTION. *Hydro-*

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Tongue-lesions.

Ulcer. *Silv. nit.* or *acid nit mer.*, appl. local., iii. F-12.

Tænia (Tape-Worm).
Naphthalin, gr. xv. (0.97 grm.) fol. by ℥ij (75 grms.) *castor-oil*, v. A-100. *Ol. tiglii*, ♏ j (0.065 grm.); *ol. ricini*, ℥ss (18.70 grms.); *chloroformi*, ♏ xx (0.97 grm.); *glycerine*, ℥ss (18.75 grms.). M. Sig.: One dose, fasting and after brisk cathart. *cocoa-nut*; *thymol*, gr. x (0.65) grm.) ev. 15 min. until 12 doses are given; *naphthalin*, gr. xv (0.97 grm.) on empt. stomach, fol. by *castor-oil*, 2 tablespoon., i. F-10. *Ol. turpentine*, tablespoon. aft. meals, i. F-11. *Ethereal ext. male fern*, or *filicic acid*, gr. xiii ¾ to lxv (0.9 to 1.2 grms.), i. F-11. Lemère de Conty treat.: Szczesny-Bronowski's treat., i. F-12. *Oil of pumkin-seed*, i. F-12.

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Pyorrhœa Alveolaris. *Oil of cinnamon*, 10-% sol.; *aristol*, iii. K-25.

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Tubercular. Incis. and curette; if this fails, castration, iii. E-3.

Tetanus.
Hypoderm. inject. *carbolic acid*; inject. *blood-serum* of immune animals, iii. M-22.

Tetany.

Rest; vegetable diet, ii. C-29.

Thermic Fever.
Prophylaxis. Avoid exert. when exposed to heat; keep up secretions, i. H-72.
Asphyxia.
Artif. resp. and subcut. inject. of *ether*, ♏ xv to xxx (0.81 to 1.75 grms.) ev. hr., and afterward, to prevent recur., give hypoderm.; *cocaine*, gr. ij to iv (0.13 to 0.26 grm.), with or without *ether*, 3 or 4 times in 24 hrs., i. H-72.
Congestive. Cold to face and head, and rub extremities, i. H-72. White-hot cautery to back, i. H-73.

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Syphilis, Treatment (*continued*).
Unna, Jullien, Leloir, Neumann, Ricord, Von Sigmund, Fournier, Mauriac, Schwimmer, Doutrelepont, Köbner, Kaposi, Lesser, Finger, Kopp, Lang, Diday, Caspary, Leloir, iii. F-28; Hutchinson, iii. F-29; Besnier, Fournier, iii. F-31; Fournier, Jelks, iii. F-32; Migneco, Schleicha, Saadek, Neumann, iii. F-33; Eich, Zeleneff, iii. F-34; Moncorvo and Ferreira, iii. F-35; Kronfeld, Waldo, Heilmann, iii. F-36; Kalachnikoff, Balzer, Augagneur, iii. F-37.

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HYDROTHORAX. Incision in sixth intercostal space; open pleura with blunt scissors; aspiration, Jenkins's methon, iii. B-25.
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IF PERICARDIAL EFFUSION, *ext. digitalis, fld.*, ♏j (0.06 grm.); alternated with *ammo. carb.*, gr. xi (0.13 grm.) in ʒj (3.75 grms.); *liq. ammo. acetat.* hourly, iii. B-5. Pericardiotomy, or paracentesis, iii. B-24.
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GOITRE. *Iodine* by cataphoresis, 10 to 20 drops daily, v. C-1. Pos. pole on inf. cervical ganglion, two neg. plates on each side of tumor, internally, *iodides*, v. C-20. Puncture; injections; enucleate gland, leaving capsule; if hæmorrhage, ligation and partial excision: galvano-puncture, being careful to avoid vessels, iv. H-6. Galvanism (15 to 30 Leclanché cells); inject. *tinct. iodine*; inject. *iodoform*; inject. *osmic acid*, syringeful every day of *aq. sol.*, gr. j (0.065 grm.) to ʒij (8 grms.) of water; *iod. pot.*, gr. ij to xv (0.133 to 1.000 grms.); locally, massage; for dyspnœa, inhalations of *chloroform* or *nitrite amyl.*, iv. H-7. If unilateral, thyroidectomy; if bilateral, double ligature and division of isthmus, iv. H-8.
CYSTIC. Neg. puncture, 35 to 40 Ma.; later, incision; apply. pos. electrode to inner wall, 100 reduced to 50 Ma., v. C-19.
EXOPHTHALMIC. For cephalalgia, *antipyrin*, iv. H-10. If anæmia, *iron*; if due to disordered menstruation, tepid douche, reduced to cold. Galvanism to neck with faradization of præcordial region; milk diet; cold to præcordial region; forced respiration; surgical partial extirpation (Kocher's meth.), iv. H-11. Galvan., 2 to 3 Ma. for 6 min., v. C-8; also, v. C-9. Reduce pulse, *quinine*, v. A-117.
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FOREIGN BODIES. Removal by forceps; if at base, use laryngoscope and remove with forceps, iii. K-46.
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CHRONIC SUPERFICIAL. *Lactic acid*, 50 % sol., i. C-4.
LUPUS. Remov. of excrescence, by cold-wire loop, fol. by appl. of *oil of menthol* (15 %), and occas. appl. of *argent nit.*; *creasote* intern., i. C-5. *Creasote*, 3 to 6 times daily, int.; and loc., appl.

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General Treatment. Liebreich's sol. *cantharidin cryst.*, gr. iii 1-10 (0.02 grm.): *pot. hydroxid.*, gr. vi 1-5 (0.4 grm.): *aq. dest.* (cold) ʒv¼ (20 grms). M. Sig.: Heat to a clear sol. on water bath; then slowly add, keeping up heat, enough cold water to make 1 litre (1 qt.). Dose, 2 to 10 ♏ (0.16 to 0.65 grm.), subcutaneous inject., i. A-39. *Creasote*, ʒiiss (10 grms.) in sol. with *olive-oil*. *Guaiacol* and *almond-oil* eq. pts., to which add 1 % *cocaine*, i. A-40. *Oxygen*, v. A-109. Hypoderm. inject. *medicated oil*, see formula. v. A-105, 106. *Oxygen*, v. A-108. Koch's tuberculin, initial dose; if patient is not debilitated, gr. 1-130 to 1-64 (0.0005 to 0.001 grm.) inject. hypod.; repeat ev. 2 or 3 days, i. A-49, 50. *Guaiacol* and *iodoform* in *olive-oil* and *vaselin* (each c.cm. of sol. to contain 2-13 gr.—0.01 grm.—*iodof.* and 4-5 gr.—0.05 grm.—*guaiacol*), given hypoderm. 1 to 3 times a day, i. A-40. Laborde's sol. each c.cm. contain. *eucalyptol*, gr. xvii⅗ (1.14 grm.); *guaiacol*, gr. 4-5 (0.05 grm.), and *iodof.*,

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TUBERCULOSIS, GENERAL TREATMENT (*continued*).

gr. 2-13 (0.01 grm.), given subcutan. ʒiij (12 c.cm.) a day, i. A-40. Inhala. compressed air, sat. with *creasote* and *eucalyptol*, i. A-40. Subcutan. inject. *blood-serum*; inhala. *chlorine-gas* and subcutan. inject. *iodin.* and *chlor. of gold* and *sodium*, i. A-40. Lannelongue's "sclerogenic meth.," inject few drops of 10 % *sol. chlor. of zinc* about nodule, i. A-41. *Thymol-acetate of mercury*, 3 pts., with 40 pts. of *paraffin liquid*; 15 drops of this sol. hypoderm. ev. 7 or 10 days, v. A-137. If fever, *iod. pot.*, gr. viss (0.40 grm.), v. A-138. *Balsam Peru*, v. A-34. Hydrotherapy, comb. with *codliver-oil* and *creasote*, v. D-27.

IN THIRD STAGE, *camphorated oil*, hypoderm., ♏xv (0.97 grm.), v. A-43. FOR COUGH, *morphia*, gr. $\frac{1}{4}$ to $\frac{3}{4}$ (0.011 to 0.019 grm.), t. i d., v. A-106. *Menthol*, inhal., v. A-94. Inject. *aristol*, dissol. in *sweet almond-oil*, v. A-28. FOR HECTIC FEVER, *europhin*, v. A-68. Inject. gr. 1-200 to 1-130 (0.0003 to 0.0005 grm.), t. i. d; as a means of diagnosis, *tuberculin*, gr. 1-13 (0.005 grm.), i. A-49. *Acetanilid*, *antifebrin*, gr. ss to iij (0.032 to 0.19 grm), v. A-1. FOR HÆMORRHAGE, common table-salt, v. A-8. *Antipyrin*, v. A-22. Antiseptic vapors, v. A-24.

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FOR PAIN, *morphia*, gr. $\frac{1}{4}$ to $\frac{3}{4}$ (0.011 to 0.019 grm.), t. i. d., v. A-106.

OF THROAT. *Bromoform*, local., v. A-41.

TUBERCULOSIS CUTANEOUS.

Besnier's meth. by *galvanocaut.* knives: flat electrode: *curette* and *dental burr*; scarification; *caustic potash*; *bichlor. mercury*. *Curette* and appl. *pyrogallic acid*, 10 % oint. twice daily; after three days, appl. *iodoform* and *boric acid*, and later *mercurial* plaster, iv. A-45.

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ABSCESS. Incision; evacuate; curette; *antiseptics*; *tonics*, iii. L-4. Antiseptic punct.: wash out cav. with *sol. boric acid*, then *sublimate sol.* 1–1000; Barker's meth.: inject. *iodoform*, iii. L-5. *Acid asepticum*, 50 % sol. locally, v. A-3.

GLANDS. Inject. *carbolic acid*, iii. L-1. *Camphorated naphthol* (*naphthol-B*), *camph.*, āā ʒiiss (10 grms.): *alcohol*, (60 %), ʒi⅓ (40 grms.): *tinct. iodine*, combined with *electricity*; hypoderm. inject. *sol. iodoform* and *ether*; Koch's *tuberculin*, iii. L-2. Hypoderm. inject. of *zinc chlor.*, 2 to 5 drops of 10-% *sol.*; *creasoted oil*; *iodoform-glycerin* inject.; *formic acid*, aërotherapy and *salt-water* baths, iii. L-3. *Antimony*, ℈j (1.30 grms.): *sulphurous* baths, v. A-19. If opened, irrig. with *lysol*, 1 to 5-% sol., v. A-93.

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SALPINGITIS. Rest, vaginal tampon, douche, massage, faradism and tonic regimen, ii. G-29. Rizkallah's ind. for op., ii. G-23, 24. Duncan's and Summer's rule for op., ii. G-25. Vaginal incis. by Grandin's meth., ii. G-27, 28.

IF ADHESION, drag down tubes by Schultze's meth., ii. G-29.

IF CATARRHAL OR SUPPURATING, neg. galvanism, ii. G-22.

IF NARROWING OF CERVICAL CANAL, Goodell's dilator, ii. G-29.

SALPINGO-OVARITIS. Neg. intra-uterine galvanic cur., 20 to 80 ma., ii. G-22.

TUMORS.

ANGIO-LIPOMA, Actual cautery; Removal.

HYGIENIC TREATMENT. Out-door exercise, iii. L-21. Lean meat and farinaceous diet, iii. L-21.

MEDICAL: *Liq. potassæ*, *arsenic* and and *sulphide of calcium*, iii. L-21.

CARCINOMA. Parenchym. inject. of 1 to 500 sol. *methyl-violet*, or *alcohol. sol. fuchsin*, iii. L-14. Inunct. or inject. *papain*. For pain and odor, apply tinct. *creasoti cum opii*; internally, *aniline*. Electricity (Schramm's meth.). iii. L-15. For scirrhous glands, inject. *acetic acid*. Local application of ice: Sprague's method. Operative procedure, rules for, iii. L-16. Chiene's test for carcinoma, iii. L-17. Voltaic curr., 600 Ma.; galvan. by platinum needles or carbon electrodes, direct to tumor, v. C-12. *Cantharides*, v. A-15. *Tinct. aconite*, ♏x (0.60 c.cm.), combined with *iod. potash* and *alkalies*, v. A-3. *Methyl-violet sol.*, 1 to 500, inject. ʒ¾ to iss (3 to 6 grms.) into growth, v. A-15. *Pyoktanin*, v. A-16, 17. *Methyl-blue*, inter. gr. iss to vii¾ (0.1 to 0.5 grm.); hypoderm. ♏ 4-5 (0.05 c.cm.) of 2 % sol., v. A-17.

EPITHELIOMA, ULCERATING. *Aristol*, v. A-27, 28. Inject. *caustic potash*, v. A 114.

HÆMANGIOMA. Cauterize with pure *nitric acid*; galvano-cautery; inject. *tinct. chloride of iron*; Paquelin thermo-cautery; wash with *cor. sub.* 1 to 1000; dress with *iodoform gauze*, iii. L-20.

HYGROMA. Incis. and drainage, iii. L-21.

OSTEOSARCOMA. *Methyl-violet*, 1 to 1000 to 1 to 300, inject hypoderm., iii. H-25.

TYPHOID FEVER.

PROPHYLAXIS. *Cupric sulph* ℥i⅔ (50 grms.) to Oij (1 litre) of water, as disinfect. i. H-48. *Cup. sulph.*, ʒiij (12 grms.) to Oij (1 litre) of water, to disinfect hands and face of attend. and parts soiled by deject., i. H-48. *Antiseptic vapors*, v. A-24.

GENERAL TREATMENT.

Antifebrin, v. A-1. During conval., *malt extract*, v. A-8. *Chloroform*, v. A-52. *Echinacea angustifolia*, as an antizymot., v. A-64. *Euphorin*, v. A-68. *Iodopyrin*, gr. vij to xxij (0.45 to 1.43 grms.), v. A-91. *Salol*, 10 pts., *olive-oil* and *water*, each 60 pts., as intern. antisept., v. A-126. Brand's treat.: hypoderm. inject. of large quant. 0.6 to 0.7 % sol. *sod. chlor.* once or twice daily, v. D-34. Along with *calomel*, give *bism. subnit.*, gr. iiss (0.16 grm.); *quinine sulph.*, gr. iss (0.097 grm.); *naphthalin*, gr. ⅓ (0.032 grm.), i. H-49. *Salol*, ʒss to j (2 to 4 grms.) alone, or with *bism. salicyl.*, in 24 hrs., i. H-48. Cold and tepid baths, i. H-48, 50. *Chlorine water*, ℥xij (360 grms.) with *quinine*, gr. xxiv to xxxvj (1.55 to 2.33 grms.); *syr. orange-peel*, ℥j (31 grms), ev. 2, 3, or 4 hrs., i. H-48. *Naphthalin*, gr. v (0.32 grm.), ev. 4 hrs. alternat. with dose of *hydrochlor. ac.* dil., and foll. 2 doses of gr. j (0.065 grm.) of *calomel* with soda, i. H-49. During convales. give tonics and electric., i. H-43.

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TUBERCULOSIS, PATHOLOGICAL ANATOMY (*continued*).

Schron, Zenker, Roosevelt, i. A-25; Kahlden, i. A-26; W. S. Fenwick, Marfan, A. L. Loomis, i. A-27; Coats, Fowler, Martin, i. A-28. PROPHYLAXIS: Cornet, *Berliner klinische Wochenschrift*, Heller, i. A-32: Woodhead, Sandberg, Thorne, i. A-36; W. Halle, Wick, i. A-37; Cornet, i. A-38. STAINING OF THE BACILLUS: Biedert, i. A-23. Kroning, Dahmen, i. A-24. SYMPTOMATOLOGY: Landouzy, Cuffer, i. A-28; Marfan, i. A-29. TREATMENT: Harris, Wolff, i. A-38; Brunn, Liebreich, P. Heymann, G. Guttmann, B. Fraenkel, Gruettner, Bogroff, von Rennenkampff, Tranjen, Burlureaux, i. A-39; Jumon, Gimbert, Diamantberger, Picot, Laborde and Pignol, Germain Sée, Richet and Héricourt, Lépine, Shurly and Gibbes, i. A-40; Lannelongue, Grancher and Martin, Koch, i. A-41; Koch, i. A-42; Riehl, Jacobi, Rindfleisch, Schimmelbusch, Kromayer, Browicz, i. A-46: Virchow, i. A-47: Libbertz, Koch, Klebs, Hunter, Koch, i. A-48; Whittaker, i. A-49: Koch, Ehrlich, Grabower, Schmidt, Schede, Fürbringer, Langenbuch, Guthrie-Leigh, Watson Cheyne, i. A-50.

TUBERCULOSIS — CUTANEOUS: James C. White, iv. A-42; Hallopeau, Debove, Riehl, Paltauf, Prioleau, John T. Bowen, iv. A-43; Koch, Doutrelepont, G. H. Fox, Besnier, Van Harlingen, G. T. Jackson, iv. A-44; Van Harlingen, Fox, White, iv. A-45.

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TYPHOID FEVER (*continued*).

DIET. Milk; meat broths, with raw eggs, i. H-49. *Zinc sulpho-carbol.*, gr. iiss (0.16 grm.) ev. 2 hrs. until stools are free from odor, i. H-49. *Calomel*, gr. ¾ (0.49 grm.) ev. hr. for 10 doses, with garg. of *potass. chlor.*, i. H-49.

COMPLICATIONS.

FOR DIARRHŒA, *ergot fld. ext.*, ♏xx to xxx (1.25 to 1.87 grms.) ev. 4 to 8 hrs., p. r. n., i. H-50. *Lactic ac.*, ʒiv to v¼ (15-20 grms.); *hydrochlor. ac.*, gr. xxxij (2 grms.), i. H-50. *Boric ac.*, gr. x to xx (0.65-1.30 grms.) ev. 4 hrs., i. H-50. *Sod. iod.*, gr. v, with *sod. benz.*, gr. v, in milk, ev. 2 to 2½ hrs., i. H-50.

DIARRHŒA AND METEORISM. *Lactic ac.*, ʒvi¾ to viij (25 to 30 grms.) daily, i. H-50.

FOR ACUTE DYSPEPSIA, sterilis. milk, ii. M-5.

VOMITING AND DIARRHŒA. Stomach-washing, followed by rest for 24 hrs., ii. M-6. Barley- or lime-water as diluent, ii. M-6.

INTESTINAL PERFORATION. Immediate laparotomy. If operation is fol. by distension, give enemata of *magnes. sulph.*, with *glycerin* and *water*, iii. C-100, 101. Median laparotomy; close perforation; wash out and drain cavity, iii. C-102. Perforation; laparotomy, i. H-52.

IN THE FEMALE, drain by vagina and abdom. cavity, iii. C-102.

FOR NEURALGIC PAINS, *rhus toxicodendron*, v. A-122.

FOR PYREXIA, cold-water baths ev. 3 hrs., i. H-51. Flush out the colon, i. H-52. *Thallin*; *cold-water enemata*, v. A-137. Antipyretics and cold sponge, i. H-49. Cold baths, v. D-23, 24, or cold cloths wrapped around body, renew ev. 2 hrs., v. D-24. Cold enteroclysms, v. D-33, 34. Cold baths, i. H-43. *Lactic ac.*, ʒv¼ (20 grms.), i. H-50.

FOR HYPERPYREXIA, hand spray of *spts. ammon. arom.*, ʒj (3.75 grms.); *sod. chlor.*, ʒj (3.75 grms.); *aq.*, q. s. ad Oj (½ litre), spray over one part of body at a time, i. H-20. Transfusion of *sod. chlor.*, 6 % sol., ℥xxiv (750 c.cm.), i. H-23.

PYOTHORAX, Pleurotomy, i. H-41.

FOR WEAK HEART, *nitro-glycerin*, gr. 1-50 (0.0013 grm.); *strych.*, *strophanthus*, v. A-102. *Quinine*, v. A-117. *Resorcin*, v. A-120. Infus. *digital.* foll. by *calomel*, i. H-49.

TYPHUS FEVER. Isolation: disinfect room, cloth., and patient with *corr. sub.*, i. H-54. *Echinacea augustifolia*, as an antizymot., v. A-64. *Calomel*, v. A-97.

FOR FEVER, transfusion *common salt*, 6-10 % sol., ℥xx to xxv (600 to 700 grms.), v. A-130. *Sod. tellurate*, gr. 4-5 (0.05 grm.) daily, v. A-131. Cold water, v. A-142. Large amt. cold water, v. D-33.

ULCERS.

Chlorphenol, v. A-52. *Pyoktanin*, v. A-16. *Dermatol*, v. A-37. Powd. *boric acid*, v. A-39.

CHRONIC, INDOLENT. *Oint. copaiba* and *resin cerate*, āā, v. A-57.

GANGRENOUS. *Aristol*, v. A-27.

LEPROUS. *Pwd. boric acid*, v. A-39.

SYPHILITIC. *Salicylate of mercury*, 1 pt.; *carbonate pot.*, 1 pt.; *distilled water*, 100 pts.; or *mercury salicyl.*, 1 pt.; *vaselin*, 30 pts., appl. by means of compress, iv. A-49. *Europhen*, pwd., and in 2 to 10 % oint., iv. A-51. *Sod.* and *pot.* comp. of *sodoiodol*, v. A-132.

TUBERCULOUS. *Euphorin*, in pwd., salve, or *alcoh. sol.*, v. A-69. Appl. of gauze, sat. with *balsam Peru*, iv. A-51.

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THERAPEUSIS.

ULCERS (*continued*).

VARICOSE. *Aristol* in pwd. or 10 % salve, v. A-27. *Aristol*, ʒss (1.94 grms.); ol. olivæ, ʒij (7.78 grms.); lanolin, ʒvss (21.38 grms.). M. Apply twice daily. v. A-28.

VENEREAL. *Aristol*, v. A-27. *Euphorin* in pwd., salve, or *alcoh. sol.*, v. A-68.

URÆMIA.

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URETHRA, DISEASES OF.

ATRESIA. Pass catheter.; if this fails, external section, iii. E-4.

GLEET. *Kava-kava*, v. A-93.

GONORRHŒA. *Ergot*, gr. v (0.32 grm.) to ℥x (300 grms.) dist. water; inject. ureth. sev. times daily; v. A-64. *Euphorin*, v. A-69. *Kava-kava*, v. A-93. *Resorcin* inject., v. A-120. *Methyl-violet.*, inject. sol. (1 to 150) 10 to 15 times a day, v. A-14, 16. FOR CHORDEE, *monobromide of camphor*, by suppos., v. A-44. *Nitrate silv.*, inject. (1 in 4000 to 1 in 2000) 4 to 6 times daily; during convales., 1 inject. a day. Rona's meth. *Thallin sulph.*, 3 % sol., grad. increas. to 24 %, inject. iii. E-5. *Copper sulph.*, *glycerole of tannin*, iii. E-6. *Silver nit.*; in abort. treat., begin with 1 to 20, inject., v. A-130. Inject. 1 % sol. *soda bicarb.*, v. A-130. *Sozoiodolate of zinc* ½ to 1½ % *aq. sol.*, ad 2½ % *laudanum;* if chronic, replace *laudanum* by 1 % *bismuth salicy.*, v. A-132. *Styracol*, intern., v. A-133. Inject. *vaccinium myrtilli*, v. A-140. Galvanism, pos. pole, connect with copper sound, 80 to 100 Ma. for 10 min.: *pot. iod.* by cataphor.; urethra, pos. pole. 25 Ma.; cervical canal, neg. pole, 50 Ma., v. C-6.

SPASM. *Atrop. sulph.*, gr. 1-25 (0.0026 grm.), v. A-36.

STRICTURE OF. Before pass. sound, inject. 5 to 10 % sol. *cocaine*, also before intern. urethot., v. A-55 Brown's urethroscope, iii. E-4. *Electrolysis*, iii. E-6. Excis. and urethroplasty, iii. E-6. Flührer's urethrotome, iii. E-7. Dilatation, iii. E-7.

URETHRA, FEMALE, DISEASES.

CARUNCLE. Inj. of *glycerole of carbol. ac.*, after appl. *cocaine* (8 %) sol.; excis. with cauterization, ii. H-8.

CONDYLOMATA. *Cauterize*, ii. H-8.

GONORRHŒA. Intra-uterine inject. of *zinc chlor.;* appl. tamp.: *zinc chlor.* 25 to 50 % sol. to os, ii. F-36. *Creolin*, ii. F-36.

PROLAPSE. Remove prolapsed mass, ii. H-8.

STRICTURE. Linear electrol.; urethrotomy. ii. H-8.

URETHRITIS.

CHRONIC. *Iodof.* bougies, paint with *argent. nit.*, ʒj (3.89 grms.) to aq. destil., ʒj (3.75 grms.), ii. H-7; or with *tr. iod.*, ii. H-8.

URINARY FEVER.

Salol, gr. ix (3.89 grms.) 2 days previous to operation; on day of op., *diuretin*, gr. x (0.65 grm.) ev. 4 hrs.; may comb. with *morphia*, v. A-61.

URTICARIA.

CHRONIC. *Belladon.*, gr. 2-13 to ⅛ (0.01 to 0.03 grm.) v. A-35. In intermittent forms, *quinia sulph.*, gr. v to x (0.33 to 0.66 grm.); may be comb. with *Fowler's sol.*, ♏xx to xv (1.3 to 0.97 grms.), iv. A-48. *Alkalies*, *arsenic*, and *naphthol*, iv. A-48. For pruritus, *chloral hyd.*, ʒiij (11.66 grms.); *aq. laurocerasi*, f℥ij (210.00 grms.); *aq.* ad Oj (½ litre). M. Sig.: Appl. local.; or *tinct. camphoræ*, ℥j (30 grms.); *aq. chloroform.*, ad f℥x (297.00 grms.). M. iv. A-48. FOR FIRST MANIFESTATIONS, *aconitia*, gr. 1-120 (0.00054 grm.), iv. A-48.

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ANTISEPTICS. Double *cyanide of merc.* and *zinc*, iii. O-1. *Sublimate* and *sod. chlor. sol.*, iii. O-5. *Microcidine*, iii. O-7. *Dermatol*, v. A-38. *Boric acid*, strong sol.; apply gauze soaked with 4 to 7 % sol.; cov. with *gutta-percha*. *Boracic acid* and *borax*. v. A-39. *Carbolic acid*, gr. xx (1.3 grms.) to ℥j (31 grms.); *styptic colloid.*; *carbolic acid*, 1-100, v. A-46. *Bichloride*, 1-5000, v. A-46. *Chlorphenol*, v. A-52. *Christia*, v. A-53. *Euphorin*, v. A-67. *Gallacetophenon*, v. A-73.
ASEPTIC INSTRUMENTS. Knives, iii. O-18.
FOR NEEDLES, *alcohol*, fol. with *benzin*, and appl. cork to point: *sterilising apparatus*, Kaschkaroff's, Kahnemann's, Braatz's, and Cushing's, iii. O-15. Lantenschläger's, iii. O-16.
NEEDLE-HOLDER, Crile's, iii. O-16.
CATGUT-HOLDERS. Bowlan's; Vömel's; hypoderm. syr., Thomas's, iii. O-17.
SPONGE-HOLDERS, Mosher's "harpoon sponge-holder"
BANDAGES. Plaster-of-Paris; *silicate of sodium*, iii. O-12.

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Wounds. Dressings and Antiseptics (*continued*).
  Dressings. *Straw-ashes* on gauze, applied local. over *iodoform gauze*: *Spanish moss*, iii. O-11. For solid dressings, *paraffo-stearin*, iii. O-11. Kelly's hermetic dress., iii. O-7, 8. *Kaori resin*; *zinc sulph.*, iii. O-8. *Aristol*; *lysol*; *dermatol*, iii. O-9.
  Hand, Disinfection. *Permangan. pot. sol.*, washed off in *oxalic-acid sol.*; *hydrogen perox.*, iii. O-10.
  Ligatures. Kocher's meth. of prep., iii. O-13. Catgut prefer. in deep sutures; Slee's asept. suture cylinder, iii. O-14.
  Sponges. Maylard's meth. of prep., iii. O-12. Egyptian *loofah*, iii. O-13.
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  Lacerated. Moullin's sublimate baths, iii. O-9. *Chlorophenol*, iii. O-10.

Yellow Fever.
  Prophylaxis. Careful inspect. and quarant. of vessel at port of departure of vessel, or estab. inspect. and refuge-stations, i. H-69. Disinfect. includ. ventil., cleanliness, *sulph.* fumig., flood with *cor. sub. sol.*, and appl. dry or wet heat to ship and all its cargo, i. H-70. Méricourt's meth., i. H-70.

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Yellow Fever—Kemp, i. H-69. **Prophylaxis**: Cochran, i. H-69. **Protective Inoculation**: Finley and Delgado, i. H-70. **Treatment**: Le Roy de Méricourt, i. H-70; Freire, i. H-71.

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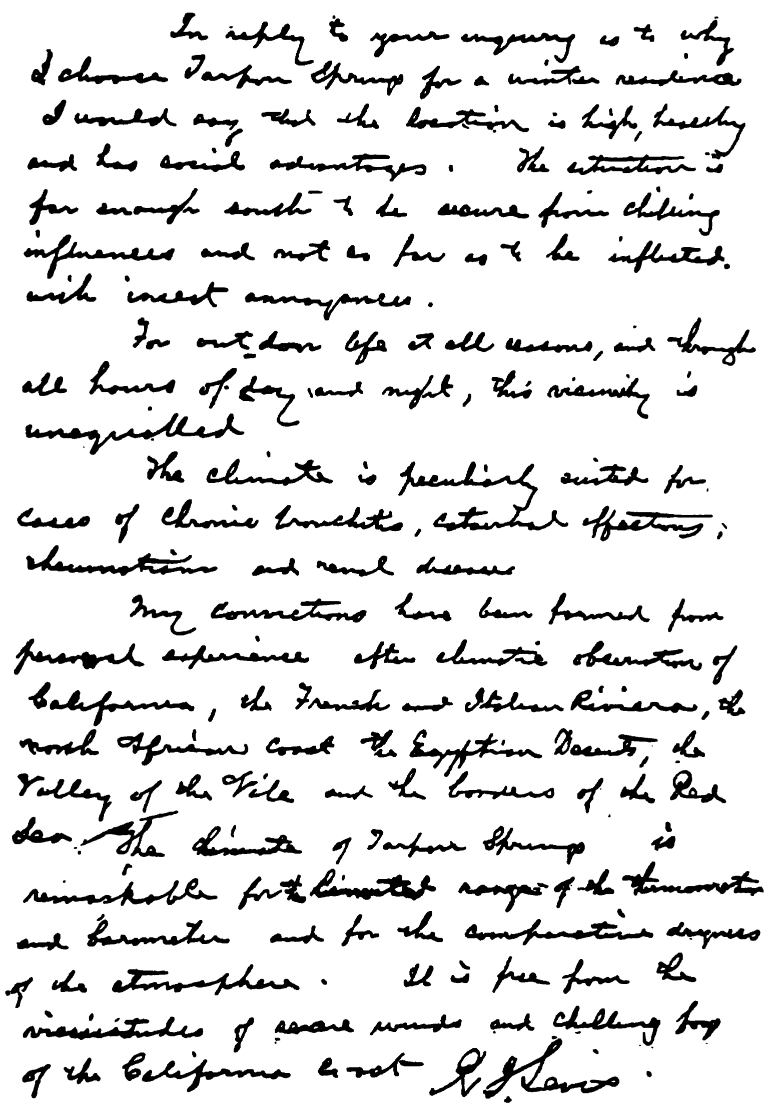

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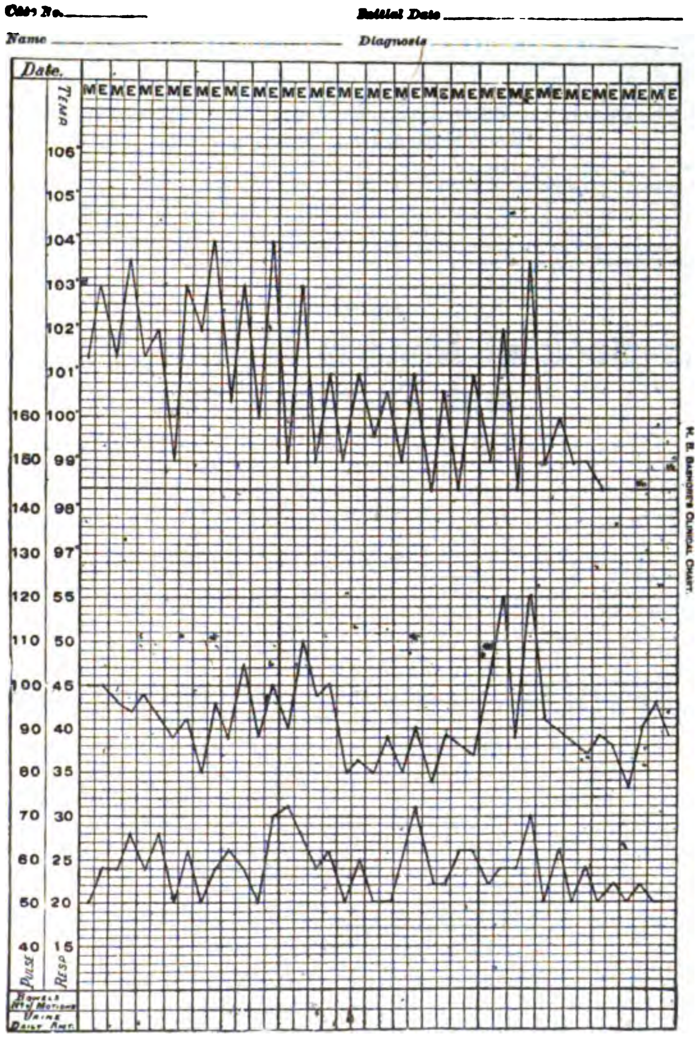

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